ALTERNATING CURRENT SIGNAL TRANSDUCER

SPHERE OF ENGINEERING TO WHICH THE INVENTION IS REFERRED

The invention is referred to electric- and radiotechnics, particularly to alternating current (AC) signal transducers; it can be used for AC-voltage power supply of any specified waveform of signal and other purposes.

THE LEVEL OF TECHNIQUES

It is known the AC signal transducer which includes connected in parallel cascades of AC signal amplification and direct current (DC) power source (“Radiolyubitel’”, #6, 1999, p.24). The disadvantages of the given transducer are its low margin of safety because the breakdown of DC power source leads to failure of running of the whole amplifier, and its power output being limited by power characteristics of active elements (transistors, lamps, etc.) on which it is built.

It is known also the AC signal amplification in result of flow method application using pair-amplifiers (European patent EP 0474 930 B1). The disadvantage of this device is that resistors are connected in series with the output to ensure similar load of each amplifier and to compensate difference of parameters between amplifiers and power supplies. These resistors have different values and adjusted individually. This leads to a decrease in power and difficult device adjustment.

The most relevant in terms of technical essence (a prototype) is the AC signal transducer protected by the patent of the Russian Federation for the utility model #70731, where the same signal is amplified by several identical cascades of amplification with same functions, which are paralleled to the input and through the transformer to the output. The disadvantage of the prototype is that the power exceeding 700 Wt is generated in it by rectangular signal (i.e. signal which has form of rectangle), for it is difficult to amplify a sinusoidal or any other signal (except for rectangular signal) to the given power (of over 700 Wt) due to the losses in power, heat, resistance of elements, characteristics of elements and complicity of the scheme.

The proposed AC signal transducer is deprived of these disadvantages because the output signal of the specified form consists of several rectangular signals. It also differs from the prototype due to the fact that it generates rectangular signal on its own and transfers it to the inputs of cascades of amplification and transduction, while at cascades of amplification and transduction rectangular signals are changed in terms of duration and amplitude. Cascades of amplification and transduction have both the same and different parameters of transduction in terms of duration and amplitude. Then rectangular signals are summed in a signal of any specified or close to any specified form. The signal of any specified form does not differ by technical characteristics from the signal close to any specified form, used for power supply.

Furthermore, the proposed AC signal transducer with its existing units automatically redistributes the load evenly on each cascade of amplification and transduction and compensates difference of parameters of amplifiers and power supplies.

ESSENCE OF THE INVENTION

The proposed AC signal transducer remains operational during the breakdown of one or all but one DC power sources and provides the opportunity of the unlimited growth of its output power due to the increase of the number of cascades of amplification and transduction and DC power sources. Whereas at cascades of amplification and transduction, at the matching output element, at the outputs of cascades of amplification and transduction, of the matching output element (transformer) or matching output elements (transformers) arriving rectangular signal is transduced into signal of any specified or close to any specified form (a sinus, a saw, etc), while to the load of the proposed AC signal transducer optimal for this load AC signal is transferred.

The proposed AC signal transducer is characterised by high efficiency, low losses of heat and power, and low cost.

DISCLOSURE OF THE INVENTION

The indicated technical result is achieved due to the following: in the AC signal transducer, including N paralleled cascades of amplification and transduction of the AC signal (where N is a natural number, N>1) and the DC power source, which serves as a power unit for one of cascades of amplification and transduction of the AC signal, there are input DC power sources in the number of N, while the output of each DC power source is connected with the supply input of its (individual) cascade of amplification and transduction of the AC signal.

The technical result of transduction of the AC rectangular signal into a signal of any specified or close to the any specified form is achieved due to three principles of work of the AC signal transducer, whereas the elements included into the given transducer may vary.

The given technical result is achieved also by the following: every cascade of amplification and transduction by form of the specified output signal transduces the AC signal in terms of duration and amplitude, while at the common output or at the output of the output element (for example, a transformer) is formed the signal of any specified or close to any specified form.

The given technical result is achieved also by the following: every cascade of amplification and transduction transforms the input AC signal in terms of duration, whereas the transformation of the signal in terms of duration takes place according to the form of the specified output signal. Then AC signals formed at cascades of amplification and transduction are transferred to primary windings of the output matching element (a transformer). At the output matching element (a transformer) the number of winds at primary windings is estimated according to the form of the specified output signal. For this reason at secondary winding the amplitude of AC signals is also formed according to the form of the specified output signal. At secondary winding AC signals are summed and at the output of the AC signal transducer there appears AC signal of any specified or close to specified form. As one of the options of the proposed invention, instead of several primary windings one winding can be used with several outputs.

The given technical result is also achieved by the following: every cascade of amplification and transduction transforms the input AC signal in terms of duration. The transformation of the AC signal in terms of duration takes place according to the form of the specified output signal. Then AC signals formed at the cascades of amplification and transduction are transferred to primary windings of the output matching elements (transformers).

At the output matching elements (transformers) due to amplification (transformation) AC signals are amplified in terms of amplitude or in terms of both power and amplitude. Amplification (transformation) of the output matching elements (transformers) takes place according to the form of the specified output signal, therefore at the integrated secondary windings amplitude of AC signals formed at the cascades of amplification and transduction will be also changed according to the form of the specified output signal. At the integrated secondary windings AC signals are summed and at the output of the AC signal transducer there appears the AC signal of any specified or close to specified form.

The given technical result is also achieved by the fact that every cascade of amplification and transduction transforms the AC rectangular signal in terms of duration. Transformation of the signal in terms of duration is carried out according to the form of the specified output signal. At the power sources there is direct voltage estimated according to the form of the specified output signal. That is why AC rectangular signals formed at the cascades of amplification and transduction in terms of amplitude will be also changed according to the form of the specified output signal. Then AC rectangular signals formed at the cascades of amplification and transduction are transferred to primary windings of output element(s) (transformer(s)). The output element (a transformer) has equal number of winds at the primary winding. Output elements (transformers) have equal amplification (transformation). Then at the secondary winding or at the integrated secondary windings and at the output of the AC signal transducer there appears the AC signal of any specified or close to specified form. In this case, upon breakdown of one or all but one power sources output signal will be corrupted.

The given technical result is achieved also by the fact that upon breakdown of one or several or all but one power sources of cascades of amplification and transduction the power supply of these cascades is switched to the not failed power source(s).

The given technical result is achieved also by the following: into the AC signal transducer is entered the block, which automatically evenly distributes the load on every cascade of amplification and transduction and compensates the difference of parameters of cascades of amplification and transduction and power sources.

Generation of the sinusoidal signal at the known AC signal transducers is achieved by the dual transduction of frequency and modulation, which leads to large power losses and to the increase of cost of the known transducers. The proposed AC signal transducer does not have these drawbacks because it generates only the frequency which is transferred to the load of the AC signal transducer.

The given technical result is achieved also by the following: two or more cascades of amplification of the AC signal include output matching elements (transformers) which work with each cascade of amplification and transduction and have integrated secondary windings or a common transformer with several primary windings where each primary winding is connected with its cascade of amplification and transduction.

BRIEF DESCRIPTION OF DRAWINGS

Figures 1-3 show functional electrical schemes of, for example, a three-cascade AC signal transducer, which explain the essence of the invention. Figures 1a-3a show structural electrical schemes of, for example, a three-cascade AC signal transducer, which explain the principle of its operation.

Figure 1 shows the variant of a three-cascade AC signal transducer with the common output of cascades of amplification and transduction.

Figure 1a shows the principle of operation of a three-cascade AC signal transducer with the common output of cascades of amplification and transduction.

Figure 2 shows the variant of a three-cascade AC signal transducer with the output elements (transformers), each of which is connected to its cascade of amplification and transduction and integrated at the output.

Figure 2a shows the principle of operation of s three-cascade AC signal transducer with the output elements (transformers), each of which is connected to its cascade of amplification and transduction and integrated at the output.

Figure 3 shows the variant of a three-cascade AC signal transducer with a common matching output element (a transformer).

Figure 3a shows the principle of operation of a three-cascade AC signal transducer with a common matching output element (a transformer).

Figure 4 shows transduction and amplification of the AC signal.

REALIZATION OF THE INVENTION

Figure 1 shows the variant with common output of cascades of amplification and transduction, which has several principles of operation.

Principle 1. At the block 1 there is the generated the AC rectangular signal, which comes to inputs 2 of cascades of amplification and transduction 3, at which it is transformed according to the form of the specified output signal in terms of duration and amplitude and it is equally amplified in terms of power. At the output 4 AC signals formed at cascades of amplification and transduction 3 are summed, and there appears signal of any or close to any specified form. Power supply of block 1 is carried out from power sources 5 through the integrated power input 6. Power supply of cascades of amplification and transduction 3 is carried out from power sources 5 with equal voltage. From output 4 through connection 7 feedback signal is transferred to block 1 for stabilization of AC signal at the output 4.

Principle 2. Principle 2 differs from Principle 1 by the following: the AC rectangular signal at the cascades of amplification and transduction is transformed only in terms of duration, while power supply of cascades of amplification and transduction 3 is carried out from power sources 5 with voltage estimated according to the form of the specified output signal, therefore, amplitude of AC rectangular signals formed at cascades of amplification and transduction 3 will be also changed according to the form of the specified output signal. Then at the output 4 there appears the AC signal of any specified form.

Figure 2 shows the variant of a three-cascade AC signal transducer with the output elements (transformers), each of which is connected to its cascade of amplification and transduction and integrated at the output with all other output elements (transformers). The given variant has several principles of operation.

Principle 1. At block 1 there is generated AC rectangular signal, which comes to the inputs 2 of cascades of amplification and transduction 3, at which it is transformed in terms of duration and amplitude and it is equally amplified in terms of power. The transformation of signal in terms of duration and amplitude is carried out according to the form of the specified output signal. Through connection 8 AC signals formed at cascades of amplification and transduction 3 are transferred to output elements (transformers) 9 with equal amplification. At the output 4 output elements (transformers) 9 are connected to each other by means of secondary windings (not indicated on Figure 2). AC signals formed at cascades of amplification and transduction 3 are summed at the output 4, and there appears signal of any specified form. Power supply of block 1 is carried out from the integrated power input 6. Power supply of cascades of amplification and transduction 3 is carried out from power sources 5 with equal voltage. From output 4 through connection 7 feedback signal is transferred to block 1 for stabilization of the AC signal at the output 4.

Principle 2. Principle 2 differs from Principle 1 by the following: the AC rectangular signal at cascades of amplification and transduction is transformed only in terms of duration, while matching output elements (transformers) 9 have amplitude amplification parameters specified according to the form of the output signal. At the output 4 the output elements (transformers) 9 are connected to each other by means of secondary windings 11 and AC signals formed at cascades of amplification and transduction 3 are summed at the output 4, and there appears a signal of any specified form.

Principle 3. Principle 3 differs from Principles 1 and 2 by the following: the AC rectangular signal at cascades of amplification and transduction is transformed only in terms of duration, while power supply of cascades of amplification is carried out from power sources 5 with the voltage estimated according to the form of the specified output signal, therefore, amplitude of AC rectangular signals formed at cascades of amplification and transduction 3 will be also changed according to the form of the specified output signal. Then AC rectangular signals formed at cascades of amplification and transduction 3 and at output elements (transformers) 9 are summed at the output 4 and there appears signal of any specified form. Meanwhile output elements (transformers) 9 have equal amplification (conversion).

Figure 3 shows the variant of a three-cascade AC signal transducer with a common matching output element (a transformer), which has several principles of operation.

Principle 1. At block 1 there is generated the AC rectangular signal, which comes to the inputs 2 of cascades of amplification and transduction 3, at which according to the form of the specified output signal it is transformed in terms of duration and amplitude and it is equally amplified in terms of power. Through connection 8 AC signals formed at cascades of amplification and transduction 3 are transferred to primary windings (not indicated on Figure 3) of output elements (transformers) 9 with equal number of winds on primary windings (not indicated on Figure 3). At the secondary winding (not indicated on Figure 3) of output element (a transformer) 9 and at the output 4 AC signals formed at cascades of amplification and transduction 3 are summed and there appears signal of any specified form. Power supply of block 1 is carried out from power sources 5 through connection 6. Power supply of cascades of amplification and transduction is carried out from power sources 5 with equal voltage. From output 4 through connection 7 the feedback signal is transferred to block 1 for stabilization of AC signal at the output 4.

Principle 2. Principle 2 differs from Principle 1 by the following: the AC rectangular signal, which is transferred to inputs 2 of cascades of amplification and transduction, is transformed only in terms of duration and is amplified in terms of power. Through connection 8 AC signals formed at cascades of amplification and transduction 3 are transferred to primary windings (not indicated on Figure 3) of matching output element (a transformer) with number of winds estimated according to the form of the specified output signal, therefore, AC signals formed at cascades of amplification and transduction 3 at the output element (a transformer) 9 are amplified in terms of amplitude also according to the form of the specified output signal.

Principle 3. Principle 3 differs from Principles 1 and 2 by the following: the AC rectangular signal at cascades of amplification and transduction 3 is transformed only in terms of duration and is amplified in terms of power. Power supply of cascades of amplification and transduction is carried out from power sources 5 with voltage estimated according to the form of the specified output signal, therefore, amplitude of AC rectangular signals at connections 8 is also formed according to the form of the specified output signal. Meanwhile the output element (a transformer) 9 has equal number of winds on primary windings (not indicated on Figure 3).

Figure 1a shows the principle of operation of a three-cascade AC signal transducer with the common output of cascades of amplification and transduction, which includes the following elements: block 1 (generator-multivibrator) consisting of schemes 1-1, 1-2, 1-3, cascades of amplification and transduction 2 consisting of blocks of transduction 3t and blocks of amplification 3a, diodes 3-3, safety devices 3-1, and switches 3-2. Blocks 3t consist of schemes of transduction 3t-1 and schemes of protection and conformation 3t-2. Blocks 3a consist of schemes of amplification 3a-1, amplifying and commuting element 3a-2, and resistors 3a-3 было. The AC signal transducer also includes DC power sources 5.

The AC signal transducer functions as follows. Block 1 with the help of scheme 1-1 generates AC rectangular signal, and through block 1-2 the AC rectangular signal is transferred to integrated inputs 2 of cascades of amplification and transduction 3. At cascades of amplification and transduction it is transformed with the help of blocks 3t as follows: at schemes 3t-1 the AC rectangular signal is transformed in terms of duration, whereas change of duration of the AC rectangular signal is carried out according to the form of the specified output signal. Then AC rectangular signals are transferred to schemes 3t-2, which function the following way: as soon as the load on one or several cascades of amplification and transduction exceeds maximum permissible level due to the difference in parameters of cascades of amplification and transduction 3 and DC power sources 5, the current on these cascades of amplification and transduction in this case becomes also above the maximum permissible level. As soon as the current on these cascades of amplification and transduction becomes above the maximum permissible level, current signal formed at resistors 3a-3 is transferred to schemes 3t-2. Then schemes 3t-2 reduce the AC signal in terms of duration and (or) amplitude. For this reason the current of one or several cascades of amplification and transduction is getting lower, and the load on these one or several cascades of amplification and transduction is redistributed to other cascades of amplification and transduction. If the load and the current exceed the maximum permissible level at all cascades of amplification and transduction, there start working similarly all cascades of amplification and transduction. In this case the load can not be redistributed and at the output 4 AC signal is reduced in terms of duration and (or) amplitude. After going through schemes 3t-2 and block 3t AC signals are transferred to block 3a consisting of schemes 3a-1, amplifying and commuting element 3a-2, and resistors 3a-3, where according to the form of the specified output signal they are transformed in terms of amplitude and are equally amplified in terms of power according to Principle 1 (Figure 1) or are amplified in terms of power according to Principle 2 (Figure 1). The transformation in terms of amplitude is carried out according to the form of the specified output signal. By means of schemes 3a-1 AC signals are transduced in terms of amplitude and are amplified in terms of power according to Principle 1 (Figure 1) or are amplified in terms of power according to Principle 2 (Figure 1). Then with the help of amplifying and commuting element 3a-2 and resistors 3a-3 AC signals are amplified in terms of power and are transferred to the output 4. At the output 4 AC signals formed at cascades of amplification and transduction 3 are summed in the specified signal. To the output 4 there is connected scheme 1-3, which is the part of block 1. Schemes 1-2 and 1-3 serve for stabilization of output voltage at the output 4. Stabilization of output voltage at the output 4 is carried out the following way: as soon as output voltage at the output 4 becomes different from the specified one, scheme 1-3 through connection 7 sends pilot signal to scheme 1-2, which increases or reduces amplitude and(or) duration of AC signal at the integrated inputs 2. This leads to stabilization of the output voltage at the output 4.

Power supply of block 1 is carried out by diodes 3-2 which are the part of cascades of amplification and transduction. These diodes 3-2 are connected to each other with anodes or cathodes 6, from which power supply of block 1 is carried out, while the other anode or cathode of diodes 3-2 is connected to its power source 5, which provides no break power supply of block 1. There can be used in transducer from one to N power sources, where N stands for number of cascades of amplification and transduction.

Power supply of cascades of amplification and transduction is carried out from power sources 5, which according to Principle 1 (Figure 1) have equal or estimated voltage according to Principle 2 (Figure 1). This voltage through safety devices 3-1 and switches 3-2 is transferred to block 1. Safety devices 3-1 and switches 3-2, which are the part of cascades of amplification and transduction 3, function the following way: switches 3-2 switch cascade or cascades of amplification and transduction 3 from broken down power sources 5 to the operating power sources 5. Meanwhile the AC signal transducer remains operational. Upon increase of number of cascades of amplification and transduction their output power is summed, which gives an opportunity of unlimited growth of device power. Safety devices 3-1 disconnect the broken down cascades of amplification and transduction 3 from power sources 5. If at least one of power sources 5 is operational, AC signal transducer remains operational. If at least one of cascades of amplification and transduction 3 is operational, AC signal transducer remains operational, but there is power lost and AC signal may be corrupted at the output 4.

Figure 2a shows the principles of operation of a three-cascade AC signal transducer with output elements (transformers), each of which is connected to its cascade of amplification and transduction and integrated at the output.

Figure 2a includes the following elements: block 1 (generator-multivibrator) consisting of schemes 1-1, 1-2, 1-3, cascades of amplification and transduction – blocks 2 consisting of blocks of transduction 3t and blocks of amplification 3a, diodes 3-3, safety devices 3-1, and switches 3-2. Blocks 3t consist of schemes of transduction 3t-1 and schemes of protection and conformation 3t-2. Blocks 3a consist of scheme of amplification 3a-1, amplifying and commuting element 3a-2, and resistors 3a-3. The AC signal transducer also includes DC power sources 5 and matching elements (transformers) 9.

The AC signal transducer functions as follows. Block 1 with the help of scheme 1-1 generates AC rectangular signal, and through scheme 1-2 AC rectangular signal is transferred to integrated inputs 2 of cascades of amplification and transduction. At the cascades of amplification and transduction it is transformed with the help of blocks 3t as follows: at schemes 3t-1 the AC rectangular signal is transformed in terms of specified duration, whereas duration of the AC rectangular signal is specified for every cascade of amplification and transduction 3 according to the form of the specified output signal. Then AC rectangular signals are transferred to schemes 3t-2, which function the following way: as soon as load on one or several cascades of amplification and transduction exceeds maximum permissible level due to difference in parameters of cascades of amplification and transduction 3 and DC power sources 5, the current on these cascades of amplification and transduction in this case becomes also above the maximum permissible level. As soon as the current on one or several cascades of amplification and transduction becomes above the maximum permissible level, the current signal formed at resistors 3a-3 is transferred to schemes 3t-2, which reduce the signal in terms of duration and (or) amplitude. For this reason the current of this one or these several cascades of amplification and transduction is getting lower, and load on this one or these several cascades of amplification and transduction is redistributed to other cascades of amplification and transduction. If the load and the current exceed the maximum permissible level at all cascades of amplification and transduction, there start working similarly all cascades of amplification and transduction. In this case the load can not be redistributed and at the output 4 AC signal is reduced in terms of duration and (or) amplitude. After going through schemes 3t-2 and block 3t AC signals are transferred to block 3a consisting of schemes 3a-1, amplifying and commuting element 3a-2, and resistors 3a-3, where they are converted in terms of amplitude and equally amplified in terms of power according to Principle 1 (Figure 2) or only amplified in terms of power according to Principles 2 and 3 (Figure 2). By means of schemes 3a-1 AC signals are converted in terms of amplitude and amplified in terms of power according to Principle 1 (Figure 2). Change of amplitude is carried out according to the form of the specified output signal. Then with the help of amplifying and commuting element 3a-2 and resistors 3a-3 AC signals are equally amplified in terms of power. Then AC signals through connection 8 are transferred to primary windings 10 of matching elements (transformers) 9, while secondary windings 11 of matching elements (transformers) 9 are integrated at the output 4. Matching elements (transformers) 9 have equal according to Principles 1 and 3 (Figure 2) or different according to Principle 2 (Figure 2) amplification (conversion). At the secondary windings 11 of matching elements (transformers) 9, which are integrated at the output 4, AC signals formed at cascades of amplification and transduction 3 are summed into the specified signal. To the output 4 there is connected scheme 1-3, which is included into block 1. Schemes 1-2 and 1-3 serve for stabilization of output voltage at the output 4. Stabilization of output voltage at the output 4 is carried out the following way: as soon as output voltage at the output 4 becomes different from the specified one, scheme 1-3 through connection 7 sends pilot signal to scheme 1-2, which increases or reduces amplitude and(or) duration of AC signal at the integrated inputs 2. This leads to stabilization of output voltage at the output 4.

Power supply of block 1 is carried out by diodes 3-2 which are the part of the cascades of amplification and transduction. These diodes 3-2 are connected to each other with anodes or cathodes by connection 6, from which power supply of block 1 is carried out, while the other anode or cathode of these diodes is connected to its power source 5, which provides no break power supply of block 1. There can be used in the transducer from one to N power sources, where N stands for the number of cascades of amplification and transduction.

Power supply of cascades of amplification and transduction is carried out from power sources 5, which have equal voltage according to Principles 1 and 2 (Figure 2) or estimated voltage according to Principle 3 (Figure 2). From power sources 5 this voltage through safety devices 3-1 and switches 3-2 is transferred to schemes 3t-1, 3t-2, and 3a-1, amplifying and commuting element 3a-2, and resistors 3a-3. Safety devices 3-1 and switches 3-2, which are the part of cascades of amplification and transduction 3, function the following way: switches 3-2 switch cascade or cascades of amplification and transduction 3 from broken down power sources 5 to the operational power sources 5. Meanwhile AC signal transducer remains operational. Upon increase of number of cascades of amplification and transduction their output power is summed, which gives an opportunity of unlimited growth of a device power. Safety devices 3-1 disconnect the broken down cascades of amplification and transduction 3 from power sources 5. If at least one of power sources 5 is operational, AC signal transducer remains operational. If at least one of cascades of amplification and transduction 3 is operational, AC signal transducer remains operational, but there is power lost and AC signal may be corrupted at the output 4.

Figure 3a shows the principle of operation of a three-cascade AC signal transducer with a common matching output element (a transformer).

Figure 3a includes the following elements: block 1 (generator-multivibrator) consisting of schemes 1-1, 1-2, 1-3, cascades of amplification and transduction – blocks 2 consisting of blocks of conversion 3t and blocks of amplification 3a, diodes 3-3, safety devices 3-1, and switches 3-2. Blocks 3t consist of schemes of conversion 3t-1 and schemes of protection and conformation 3t-2. Blocks 3a consist of scheme of amplification 3a-1, amplifying and commuting element 3a-2, and resistors 3a-3. The AC signal transducer also includes DC power sources 5 and a matching output element (a transformer) 9.

The AC signal transducer functions as follows. Block 1 with the help of scheme 1-1 generates AC rectangular signal, and through block 1-2 the AC rectangular signal is transferred to integrated inputs 2 of cascades of amplification and transduction. At the cascades of amplification and transduction AC rectangular signal is transformed with the help of blocks 3t as follows: at schemes 3t-1 the AC rectangular signal is transformed in terms of specified duration. Change of duration of the AC rectangular signal is carried out according to the form of the specified output signal. Then AC rectangular signals are transferred to schemes 3t-2, which function the following way: if due to possible difference in parameters of cascades of amplification and transduction 3 and DC power sources 5 the load on one or several cascades of amplification and transduction exceeds maximum permissible level, current in this case becomes also above the maximum permissible level. As soon as the current on these cascades of amplification and transduction becomes above the maximum permissible level, current signal formed at resistors 3a-3 is transferred to schemes 3t-2. Then the schemes 3t-2 reduce the signal in terms of duration and (or) amplitude. For this reason the current of this one or these several cascades of amplification and transduction is getting lower, and the load on this one or these several cascades of amplification and transduction is redistributed to other cascades of amplification and transduction. If the load and the current exceed the maximum permissible level at all cascades of amplification and transduction, there start working similarly all cascades of amplification and transduction. In this case the load can not be redistributed and at the output 4 AC signal is reduced in terms of duration and (or) amplitude. After going through schemes 3t-2 AC signals come to block 3a consisting of schemes 3a-1, amplifying and commuting element 3a-2, and resistors 3a-3, where they are transformed in terms of amplitude and equally are amplified in terms of power according to Principle 1 (Figure 3) or only are amplified in terms of power according to Principles 2 and 3 (Figure 3). By means of schemes 3a-1 AC signals are converted in terms of amplitude and are amplified in terms of power according to Principle 1 (Figure 3). Whereas, the change of the AC signal amplitude is carried out according to the form of the specified output signal. Then with the help of amplifying and commuting element 3a-2 and resistors 3a-3 AC signals are equally amplified in terms of power. Then AC signals through connection 8 are transferred to primary windings 10 of matching element (a transformer) 9, while secondary winding of matching element (a transformer) 9 is connected to the output 4. The matching element (a transformer) 9 has equal number of winds at primary winding 10 according to Principles 1 and 3 (Figure 3) or estimated number of winds according to the form of the output signal following Principle 2 (Figure 3). At the secondary winding 11 of matching element (transformer) 9 and at the output 4 AC signals formed at cascades of amplification and transduction 3 are summed into a signal of any specified or close to any specified form. To the output 4 there is connected scheme 1-3, which is the part of block 1. Schemes 1-2 and 1-3 serve for stabilization of output voltage at the output 4. Stabilization of output voltage at the output 4 is carried out the following way: as soon as output voltage at the output 4 becomes different from the specified one, scheme 1-3 through connection 7 sends pilot signal to scheme 1-2, which increases or reduces amplitude and(or) duration of AC signal at the integrated inputs 2. This leads to stabilization of output voltage at the output 4.

Power supply of block 1 is carried out by diodes 3-2 which are the part of cascades of amplification and transduction. These diodes 3-2 are connected to each other with anodes or cathodes by connection 6, from which power supply of block 1 is carried out, while the other anode or cathode of diodes 3-2 is connected to its power source 5, which provides no break power supply of block 1. There can be used in transducer from one to N power sources, where N stands for the number of cascades of amplification and transduction.

Power supply of cascades of amplification and transduction is carried out from power sources 5, which have equal voltage according to Principles 1 and 2 (Figure 3) or estimated voltage according to the form of specified output signal following Principle 3 (Figure 3). From power sources 5 this voltage through safety devices 3-1 and switches 3-2 is transferred to schemes 3t-1, 3t-2, and 3a-1, amplifying and commuting element 3a-2, and resistor 3a-3. Safety devices 3-1 and switches 3-2, which are the part of cascades of amplification and transduction3, function the following way: switches 3-2 switch cascade or cascades of amplification and transduction 3 from broken down power sources 5 to the operational power sources 5. Meanwhile AC signal transducer remains operational. Upon the increase of the number of cascades of amplification and transduction their output power is summed, which gives an opportunity of unlimited growth of a device power. Safety devices 3-1 disconnect the broken down cascades of amplification and transduction 3 from power sources 5. If at least one of power sources 5 is operational, AC signal transducer remains operational. If at least one cascade of amplification and transduction 3 is operational, AC signal transducer remains operational, but there is power lost and AC signal may be corrupted at the output 4.

Figure 4 shows transduction and amplification of the AC signal.

Figure 4 “a” gives view of the AC rectangular signal at the integrated inputs 2 of cascades of amplification and transduction.

Figures 4 “b”, 4 “c”, 4 “d” give views of AC rectangular signals at connection 8 of cascades of amplification and transduction.

Figures 4 “e” and 4 “f” give view of the AC signal at the output 4 of cascades of amplification and transduction.

DRAWINGS

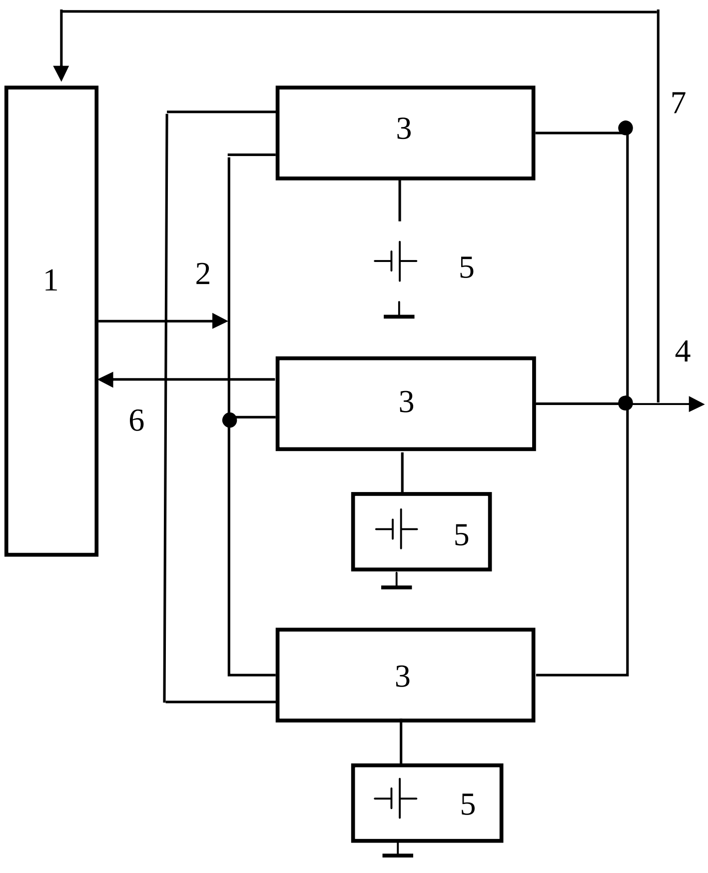


Fig. 1

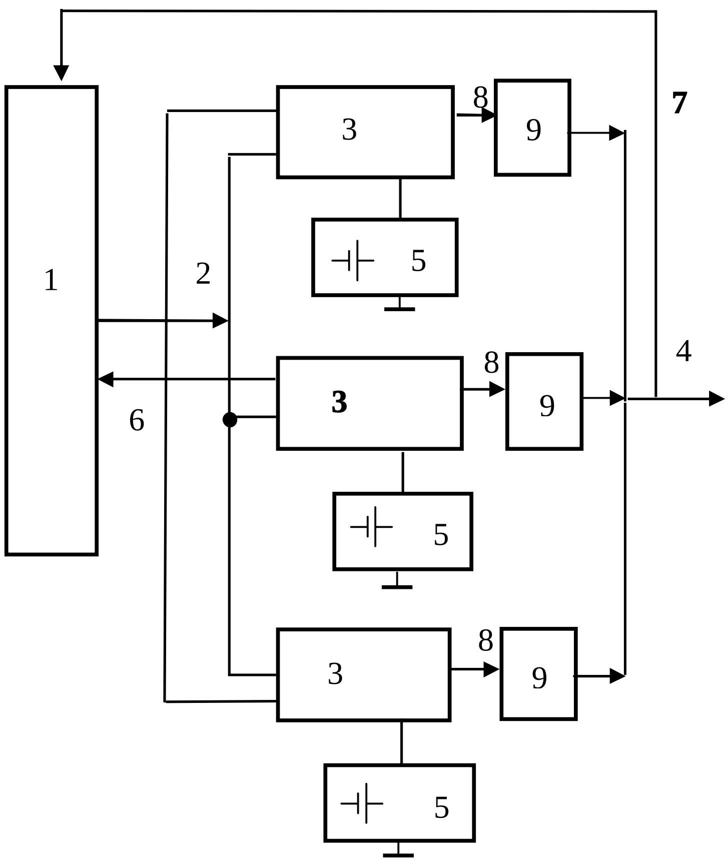


Fig. 2

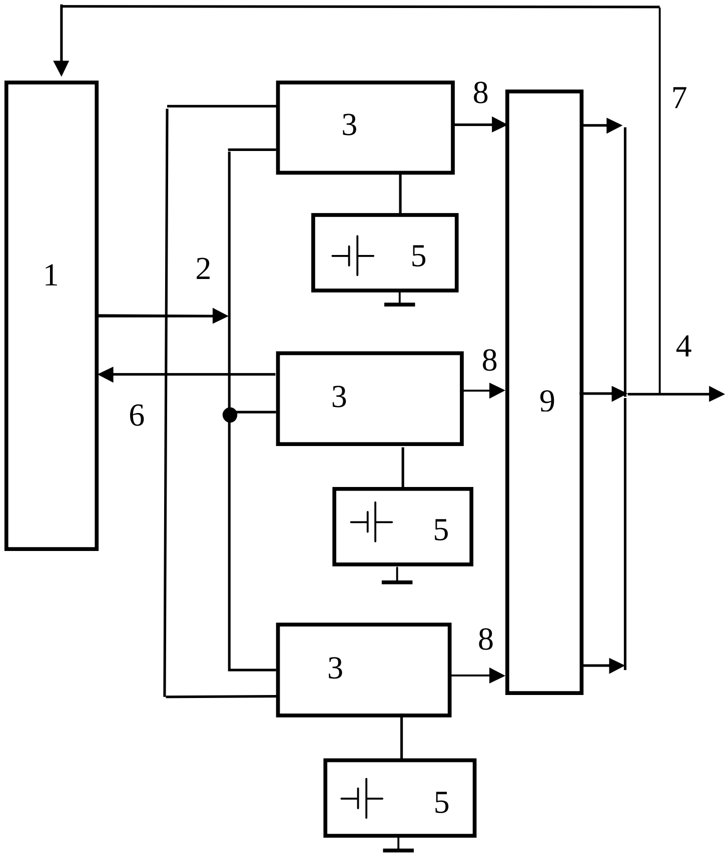


Fig. 3

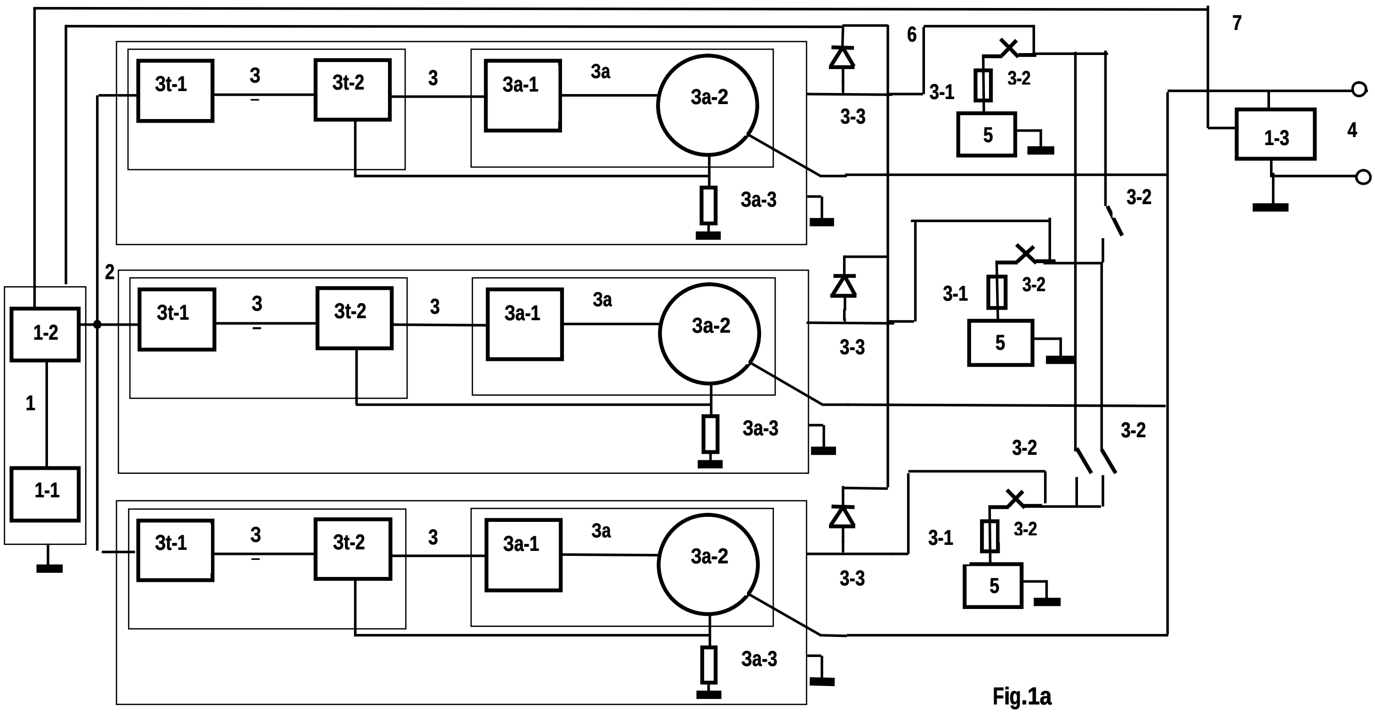
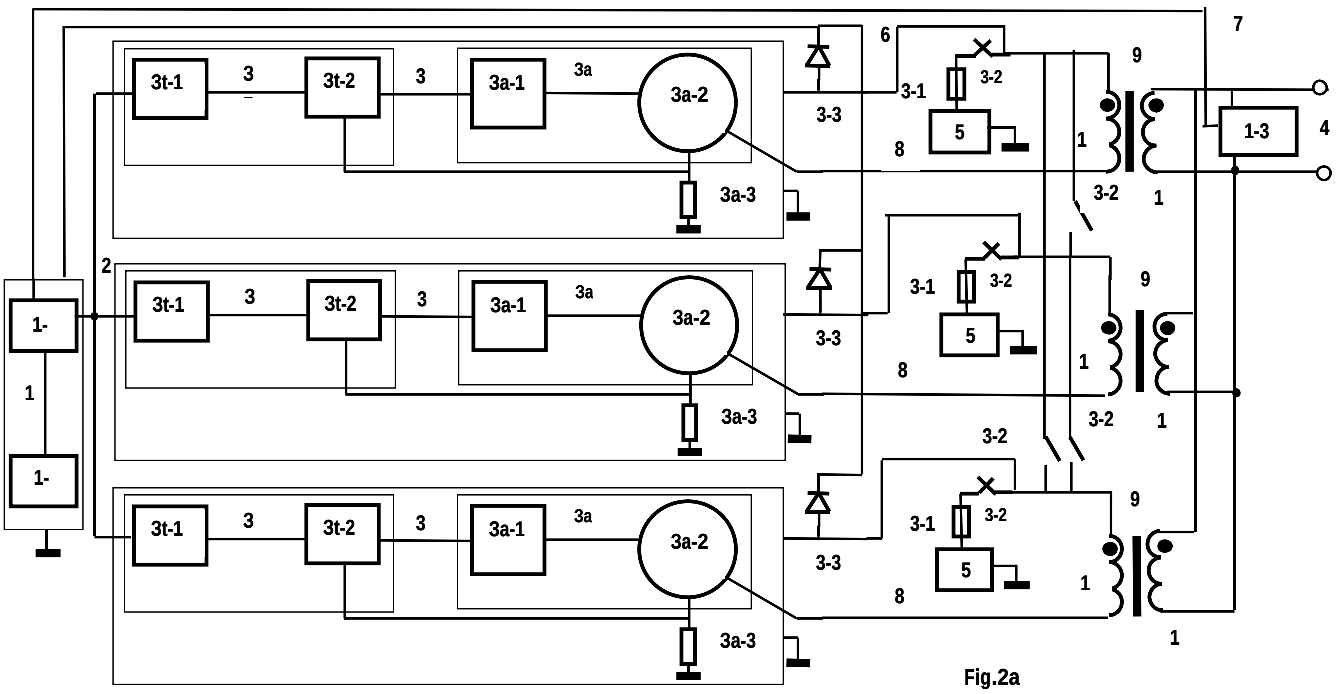


Fig.1a



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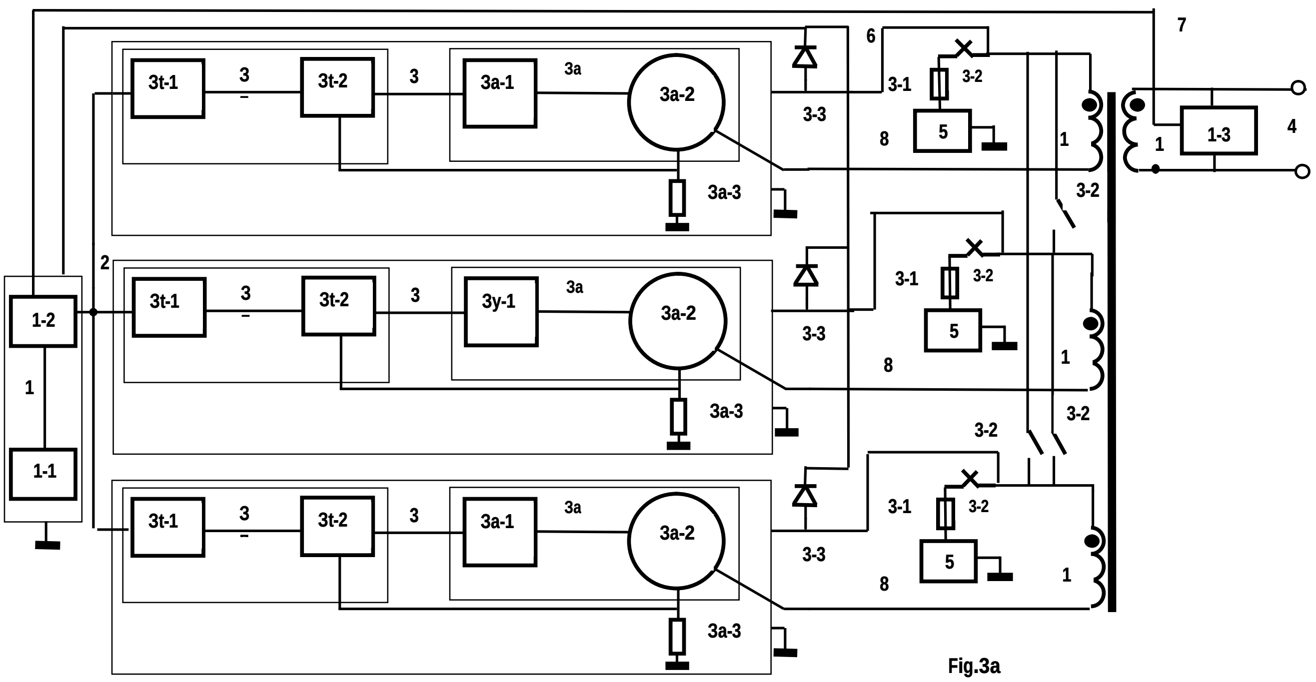
3t-2
3
3a-1
3a
3a-2
3-3
3-1
3-2
5
8
1
9
3a-3
3-2
1
3-2
3t-1
3
3t-2
3
3a-1
3a
3a-2
3-3
3-1
3-2
5
8
1
9
3a-3
1

Fig.2a



7
6
4
3t-1
3
3t-2
3
3a-1
3a
3a-2
3-3
3-1
3-2
5
8
1
1
1-3
3a-3
3-2
2
1-2
1
1-1
3t-1
3
3t-2
3
3y-1
3a
3a-2
3-3
3-1
3-2
5
8
1
3a-3
3-2
3-2
3t-1
3
3t-2
3
3a-1
3a
3a-2
3-3
3-1
3-2
5
8
1
3a-3

Fig.3a

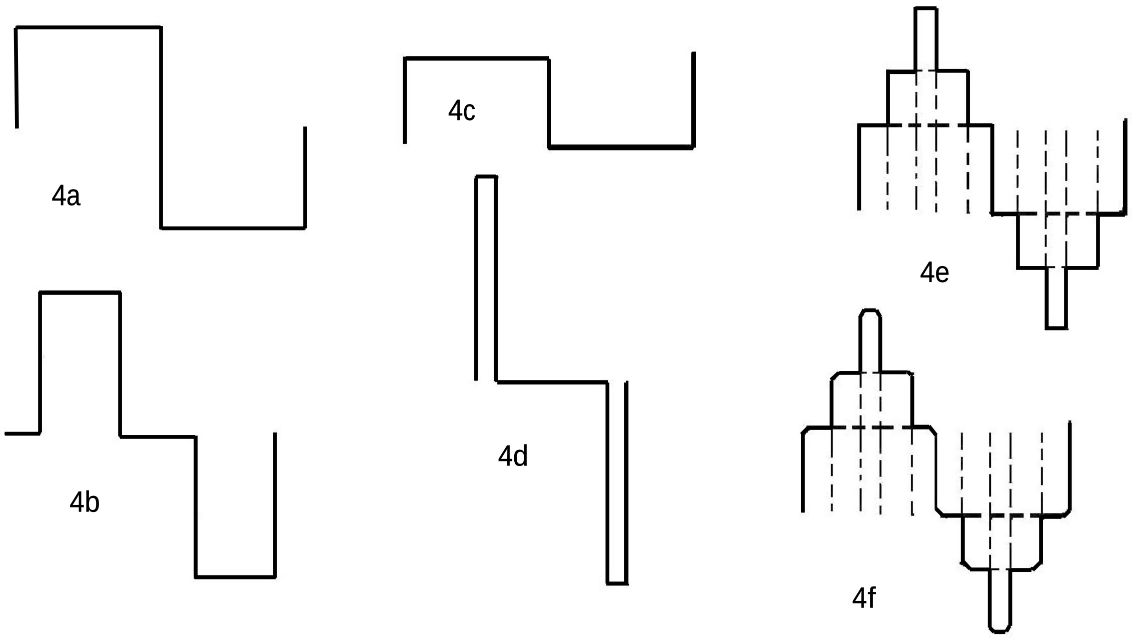


Fig. 4

VIDEO

Proofs for real existence and efficiency of the invention are confirmed by video – see **http://www.youtube.com/watch?v=Sdlo1tbkYdU**