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(54) **APPARATUS FOR WRAPPING DEMAGNETIZING COILS WITH INSULATING TAPE.**

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(73) Proprietor: **COVINO, Austero**  
**Via S. Rocco 59/A**  
**I-20040 Busnago(IT)**

(72) Inventor: **COVINO, Austero**  
**Via S. Rocco 59/A**  
**I-20040 Busnago(IT)**

(74) Representative: **Filippi, Remo**  
**Via Aldrovandi, 5**  
**I-20129 Milano (IT)**

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## Description

Ordinary demagnetizing coils are known to consist of a continuous hank of electric wire covered with a plastic sheath obtained by winding a tape spirally around said hank.

The sheath so created is discontinuous, irregular and does not give satisfactory insulation.

The reference patent DE-A2602 116 teaches sheathing of a coil by using a shaped tape formed by a process of extrusion.

Said tape is placed in an annular die thus forming a kind of channel in which the coil is then laid.

Shaping rollers press the tape against the coil and thus press the edges of said tape one against the other determining superimposition of their internal face.

Said edges are closed by glueing, welding or pressure. In the latter case there is a groove in one edge and a rib on the other which, when pressed together, form a male-female connection.

There are various drawbacks to this method.

The specially extruded tape is a good deal more expensive than one of the ordinary flat tapes on the market.

The snap closure is bulky and insufficiently secure.

Contact between sheath and coil cannot be close near the edges.

Even if the edges are united by welding or glueing, in order to achieve continuity the overlapping edges must project considerably over the outer surface of the sheath forming an external longitudinal rib both bulky and of a poor appearance.

Subject of the invention is an apparatus for automatically producing demagnetizing coils comprising a hank of electric wire and a plastic sheath.

The invention is defined in the claims.

The sheath is made from an ordinary flat tape made to curve channelwise gradually along its length by means of a shaping guide, and is laid in the circumferential groove of a rotating drum.

The drum consists of two disks, one fixed to a drive shaft and the other being free to detach itself from the first, translating away by means of a mechanism but drawn along by rotation of the shaft. In this way the demagnetizing coil can be discharged and allowed to pass between the two disks.

One end of a pin is attached, but rotatable, near the edge of the disk fixed to the shaft while the other end, having passed through the translatable disk, supports a perpendicularly set arm placed in contact with a cam held to the outer side of the latter disk, by means of a spring.

A spike is mounted on the pin, at the point where there is a recess in the groove of the drum, said spike being bent in the direction opposite to that of the movement and inclined towards the inside of said groove to allow the tape to be hooked on.

When the demagnetizing coil is complete the drum is opened, namely the translating disk moves away from the fixed disk and, as a consequence, the cam, acting on the arm, determines rotation of the pin and therefore inclination of the spike towards the outside of the drum, allowing the coil to become detached.

At the start of the cycle a pincer gradually curves the longitudinal edges of the tape laying them over the hank. Each of the pincer's two jaws has at its end an articulated arm held in place by a spring and by a limit stop inside the pincer.

Inside said arm a head is fixed, said head containing a groove shaped similarly to the arc of a circle open to approximately 90°. The end of said arc, innermost towards the pincer's articulation, is substantially at 90° to the side of the arm.

Therefore, when the first jaw approaches the drum, contact between the end of the arm and the side of the drum causes said arm to rotate in its articulation overcoming resistance set up by the spring.

The effect of this movement is to bring the groove in the head close to the hank of wire, rotating towards said hank and causing one edge of the tape to curve and overlay said hank.

The second jaw then moves and lays the inner surface of the other edge of the tape over the outer surface of the first one.

A device, placed immediately beyond the pincer, comprising a roller to press down the edges of the tape together with a blowpipe for emission of hot air and a blowpipe for cooling air, welds the two edges of the tape by simultaneous application of pressure and heat.

When the electric wire, fed in from a store to form the hank, has passed across a recess in one of the edges of the groove in the drum, it becomes hooked onto one side of said drum.

The tape and electric wire having been hooked to the drum and after the drum has completed about one turn, the tape is cut off at a point where it can sufficiently well overlap the end hooked to the drum and the automatic cycle then begins, as follows:

- the hank is formed within the channel shaped tape, this being done by a previously fixed number of drum turns,
- the pincer functions causing the tape's edges to curve,
- the welding device welds the edges,

- the number of turns are made needed to form and weld the sheath along the whole length of the demagnetizing coil,
- the machine stops.

This sequence is operated and checked by an electronic unit comprising a programmer, together with various devices for control and information.

A number of sensors: cause the second jaw of the pincer to operate after the first jaw has completed curving of the first edge of the tape; bring the pressure roller up to the drum when the second jaw has completed curving the second edge of the tape; cause the welding blowpipe to function after the pressure roller has completed its stroke; open the drum to discharge the demagnetizing coil when said coil is complete.

The invention described offers considerable advantages. The cost of the sheath is much lower as one of the flat tapes already on the market is used and not one specifically extruded.

The sheath ensures close adherence to the coil without any projections, ribs or roughness, bult being reduced to a minimum and appearance appreciably improved.

Characteristics and purposes of the invention will be made even clearer by the following example of its execution illustrated by drawings.

#### Example of execution

- Fig.1. Dual machine unit working according to the process subject of the invention, seen from the front.
- Fig.2. Perspective showing functioning of a machine.
- Fig.3. Perspective showing detail of the drum when open.
- Fig.4. Perspective showing detail of the drum when closed.
- Fig. 5. Perspective view of the tape guide.
- Fig. 6. Diagram of side view of the machine when idle.
- Fig. 7. Diagram of side view of the machine when the tape has been hooked on.
- Fig. 8. Cross section detail of the drum.
- Fig. 9. Diagram of side view of the machine when the electric wire has been hooked an and the tape cut off.
- Fig.10. Cross section detail of the drum when all turns of the coil have been completed.
- Fig.11. Cross section detail of the drum with the pincers open.
- Fig.12. Side view detail of the drum after approach of the first pincer jaw.
- Fig.13. Cross section detail of the drum after closure of the pincers.
- Fig.14. Diagram of side view of the machine

after closure of the pincers.

Fig.15. Diagram of side view of the machine following approach of the welding device.

Fig.16. Cross section detail of the drum.

Fig.17. Diagram of side view of the machine when the demagnetizing coil has been completed at the moment when the electric wire is cut.

Fig.18. Perspective view of a demagnetizing coil extracted from the machine.

The complex (10) comprises the two substantially similar machines (11), (12), the control unit (13), the pneumatic unit (14), the electric-electronic unit (15) and the base (16).

Each machine can operate independently of the other so that one sequence of functions can proceed while the other machine is being prepared for the next sequence.

The machine (11) comprises the framework (17), the drum (20) drawn along by the shaft (30), the step-by-step electric motor (31), the transmission (32), the reel (46) for feeding in the tape (24), the pincers (23) for shaping the sheath (24'')-(Fig.13), the electric wire (27) container (87), the programmer (28) fixing the number of turns for each coil, the button switch (34) for starting up the machine.

The reel (46) is served by the brake consisting of the roller (40) fixed to the reel, the block (41) articulating on the pin (42) in said lever (43) pivoting at (44) and loaded by the traction spring (45).

As will be more fully explained below, the tape (24), through the transmission wheels (48) (48') and (49), (49') and the shaping guide (35), can be hooked to the drum (20).

The drum is made up of the disk (21) mounted on the shaft (30) (see also Figs. 3 and 4) and of the disk (22) caused to rotate with said shaft but free to translate pushed by the bushing (50) fixed to the sleeve (51).

Said sleeve is worked by the fork (52) fixed to the lever (53) rotating on the pin (54) of support (55). At the other end of the lever the pin (56) connects it to the piston (57) of the pneumatic cylinder (58) worked by the handle (33) see (Fig.1).

The smaller shaft (61) is mounted on the disk (21) by a screw (60), said shaft passing through the disk (22) and emerging near to the cam (62) is fixed in position by screws (63), (64).

The perpendicular arm (65) is mounted on a shaft (61) and is connected to the pin (66) on a disk (22) by a traction spring (67).

Also on said shaft (61) is mounted the spike (68) between the two disks (21) and (22).

When disk (22) is detached from disk (21) (Fig.3), cam (62) by action on arm (65), has caused the shaft (61) to rotate until it orientates the spike

(68) to turn away from drum (20).

When however disk (22) is pushed up against disk (21), said cam no longer prevents rotation of shaft (61) by action of spring (67).

The spike (68) thus becomes inclined towards the drum (Fig.4) and so can hook onto the tape when the cycle starts.

When the two disks (21), (22) match up together they complete the circumferential groove (69) (Fig.4) while spike (68) lies between the notches (88) and (89) cut in the edges of said disks.

At its other end, shaft (30) sustained by supports (70),(71), carries the cog wheel (73) forming part of the transmission unit (32) which comprises the secondary shaft (72) carrying cog wheels (74) and (75).

Cog wheel (76) is mounted on the shaft (79) carrying the step-by-step motor (31).

The cogged belts (77) and (78) respectively connect the pairs of cog wheels (73), (74) and (75), (76).

Corresponding with shaft (30) is the electronic control device (86),connected to the electronic unit (15),comprising disks (80), (81) notched at (82) and (83) in order so to create pulses on the photoelectric cells (84), (85).

Passing over transmission rollers (90), (91), (92),the electric wire (27) is brought near the drum (20) slowed down by pincers (93), (94).

At the free end of lever (100) pivoting at (101), fork(102) articulates connected by the compression spring (103) to the strut(104) articulating by pin (105) on lever (106) pivoted on the bracket (107).

The pin (108) is mounted on lever (100) carrying the roller (109).

Notch (96) is cut into the edge of disk (21) of the drum (20), said notch allowing passage at the end of the electric wire (27) and hook-up to spring (97) mounted inside a hole (98) in disk (21) (see also Fig.10).

At the point of drum (20), the pincers (23) are placed, with jaws (110), (111) articulating on pin (112) (see also Fig.11), comprising arms (113), (114) with rounded ends (125), (126) said arms articulating in pins (115), (116), respectively supporting head (117) with its groove (118) and head (119) with its groove (120).

The upper ends, respectively (118') and (120') of said grooves are at about 90° in relation to the sides of the arms. The heads are respectively pulled by the traction springs (121), (122) against the ends of the end-stroke screws (123), (124) adjusting the position of said heads.

The jaws are worked respectively by the pneumatic cylinders (130), (131) suspended to rods (132), (133).

Close to the circumference of the drum a device is placed, supplying heat and pressure, for welding the edges of the sheath, and including blowpipe (140) emitting hot air from the body (141) containing electric resistances, supported by shaft (142) to which is fixed the arm (143) connected to the pneumatic cylinder (144).

The pressure roller (145) is placed immediately beyond the blowpipe, said roller being supported by the angular lever (146) pivoting at (147) and operated by the pneumatic cylinder (148).

Near to the roller is the nozzle (149) blowing out cooling air.

The shaping guide (35), (Fig.5) comprises an initial flat part (35') with the edges (36), (37) bent back so as to create a rectangular fissure and a final part (35'') approximately V-shaped.

The edges (36'), (37') inside said "V", remain practically parallel to the outer faces of the guide.

There is a hook (38) on the back side of the guide whose purpose is to fit onto the pin (39) placed on the machine near the drum (20), (Figs. 2 and 7).

In Fig.1 the machine (12) shows the main features corresponding to those of machine(11) such as the frame (150), the drum (151), the shaft (152), the step-by-step electric motor (153), the transmission (154), the handle (155), the reel (156) supplying tape (157), the pincers (158), the feeder (159) of electric wire (160), the numberer (161), and the starting button switch (162).

#### Operation

The flat end of the tape (24),(Figs. 5,6,2) is placed in mouth (35') of the shaping guide (35) from which it emerges at (24') in the form of a "V".

The drum (20), (Figs. 3, 4) is closed by acting on lever (33), (Fig.1.).

In this way the end of the tape (24') can be hooked onto the spike (68) (Figs. 7,8) while the hook (38) at the back of the guide (35) is applied to the horizontal pin (39), Figs. 2, 7).

The electric wire (27) is hooked to spring (97) an disk(21) making said wire pass through the transmission roller (109) and the notch (96) in said disk (Figs. 2, 9,10).

Drum (20) is rotated until a length of tape (24') is completely wound on it and slightly overlies the end already hooked to the spike (68) and an initial turn of electric wire is completed round the tape.

Said tape (24') is then cut by hand close to the drum and the guide (35) is overturned to allow the tape (24) to remain over the transmission roller (49') (Fig.9). At this point a start is made with forming the coil (27') by depressing push button (34)(Fig.1) having previously set the number of turns to be made on the counter (28).

When said number is nearly completed, control device (86) sends a signal to the electronic unit (15) which gradually slows down and stops the motor (31) at an exact point with automatic closure of the pincer jaws (23) (Figs.11,12,13).

When the jaws (110), (111) approach each other, the lower rounded ends (125),(126) of the arms (113), (114) make contact with disks (21), (22) of drum (20) determining, at the same time,(Figs.11, 12, 13), gradual matching of the internal sides (113'), (114') with the sides of said disks and final matching of the lower parts of heads (117), (119) with the edges (21'), (22') of said disks.

Jaw (110) is the first to approach the edge (25) of the tape (24).

Complete contact between side (113') of the arm with side (21) of the drum causes rotation of said arm and therefore of the head (117) until the upper part (118') of the arched groove (118) passes from the inclined position held by it in Fig.12 to that in Fig.13 practically perpendicular to the side of the drum.

Said combined movement of the groove (118), of approach to the hank (27') of wire and rotation towards said hank, facilitates movement and curvature of edge (25) of the tape (24') and its superimposition on said hank (27') until the position is reached as seen in Fig.13.

An electronic sensor, not shown for simplicity in the figure, sets off the second jaw (111) which, with the same mechanisms as before, by means of groove (120) in head (119), causes the edge (26) of tape (24') to curve round the hank (27) and "on top" of the edge (25).

When the pincer is fully closed (Fig.10), another sensor signals for lowering of the welding unit (Fig.15) and for rotation of about one turn of the drum to allow the edges (25) and (26) of the tape to be welded along the whole circumference of the coil creating a circular and continuous sheath (24'') (Figs. 16, 18) around the hank (27') of electric wire.

The welding device and pincers then automatically move away from the drum and the machine stops.

Hand scissors (59) are used to cut the electric wire (27) (Fig.17), the drum is opened by lever (33) (Fig.1) and the coil (29) complete with sheath (Fig.18) can be extracted by making it pass between disks (20), (21).

The machine (Fig.18) has by then returned to its position in Fig.6, ready to begin a fresh cycle.

## Claims

1. Apparatus for automatically forming demagnetizing coils made from a hank of electric wire covered with a sheath of plastic material, said apparatus comprising a rotating drum having a

groove round its perimeter in which a plastic tape is lodged and caused gradually to curve longitudinally by means of a shaping guide so as to form a channel, and comprising a device for feeding in electric wire that becomes wound in the channel formed by the tape lodged in the groove of the drum in such a way as to form a hank of electric wire, characterized in that said apparatus comprises a pincer (23) with two reciprocally independent jaws (110) (111) that act one later than the other on one edge (25) and on the other edge (26) respectively of the tape (24), and comprising a welding device (140 145 149) placed immediately beyond the pincer (23), one jaw (110) of which, when formation of the hank (27') on the tape lying in the groove (69) of the drum (20) has been completed, superimposing one edge (25) of the tape (24) over the hank (27') and the second jaw (111) immediately after superimposing the inner surface of the second edge (26) of the tape (24) over the outer surface of the first edge (25) placed over the hank (27'), the welding device, comprising a pressure roller (145) and a blowpipe (140) to supply hot air, then immediately welding together said edges (25) (26) superimposed as described.

2. Apparatus for automatically forming demagnetizing coils as in claim 1, characterized in that an arm (113),(114) is articulated at the end of each of the two jaws (110),(111) of pincer (23), said arm held in place by a spring (121),(122) and by an end-stop (123),(124) inside the pincer (23), there being fixed inside said arm (113),(114) a head (117),(119) in which is a groove (118),(120) shaped similarly to an arc of a circle open to about 90°, said arc's extremity (118'),(120') nearer the inside of the pincer (23) being substantially at an angle of 90° to the side (113'),(114') of arm (113),(114) the other extremity being turned in the direction of the jaw (110),(111), substantially parallel to said side (113'), (114'), so that as one jaw approaches the drum (20), due to contact of said jaw's end with the side of the drum its arm (113),(114) is obliged to rotate overcoming the resistance opposed by the spring (121),(122), while the groove (118), (120) of the head (117),(119) rotatingly approaches the hank (27'), curving the edge (25), (26) of the tape (24') and drawing it towards said hank.

3. Apparatus for automatically forming demagnetizing coils as in claim 1 characterized in that the drum (20) is composed of two disks (21),(22), one of them (21) being fixed to the drive

shaft (30) and the other (22) free to detach itself from the first (21) translating by means of a special mechanism but drawn in rotation by the shaft (30), said detachment allowing the demagnetizing coil (29) to be discharged, one end of a pin being rotatably attached near the edge of disk (21) fixed to shaft (30) while the other end having passed through the translatable disk (22) supports a perpendicular arm (65), placed in contact with a cam (62) fixed to said latter disk (22), by means of a spring (67), a spike (68) being placed on the pin (61) at a point where there is a recess (88), (89) in the groove (69) of the drum (20), said spike facing in the opposite direction to drum movement and inclined towards the inside of the groove (69) so as to facilitate hook-up with the tape (24), rotation of pin (61) being caused, when the drum (20) is opened namely when the translating disk (22) becomes detached from the fixed disk (21) by the effect of the cam (62) on the arm (65), and therefore inclination of the spike (68) towards the outside of the drum (20) thus facilitating discharge of the completed coil (29).

4. Apparatus for automatically forming demagnetizing coils as in claim 1, characterized in that the tape (24') and the electric wire (27) having been hooked to the drum (20), when said drum has completed about one turn and which said tape (24') has been cut at a point that will allow it to overlie sufficiently the one end hooked to the drum (20), a start is made with the automatic cycle comprising: formation of the hank (27') in the groove (69) of the tape (24'), action by the pincer (23) to curve the edges (25), (26) of the tape (24') around the hank (27'), action by the welding device with its pressure roller (145) and blowpipe (140), completion of the turn needed to form and weld the sheath (24'') to enclose the demagnetizing coil (29) and stoppage of the machine (11), said cycle being operated and controlled by an electronic unit (15) comprising a programmer and various devices (80, 81, 82, 83, 84, 85, 86) for control and information, connected to a number of sensors that bring the following into action: the second jaw (111) of pincer (23) when the first jaw (110) has curved the first edge (25) of the tape (24'), the pressure roller (145) which approaches the drum (20) when the second jaw (111) has curved the second edge (26) of tape (24'), the welding blowpipe (140) when the pressure roller (145) has ended its stroke, the drum (20) which opens to discharge the completed demagnetizing coil (29).

## Patentansprüche

1. Gerät zur automatischen Anfertigung von Entmagnetisierungsspulen, die aus einem Strang von Stromleitdraht bestehen, der mit einem Kunststoffmantel verkleidet ist, wobei das besagte Gerät eine Drehtrommel aufweist, die mit einer rundherum führenden Rille versehen ist, in welche ein Band aus Kunststoff eingelegt wird, das nach und nach rinnenartig in Längsrichtung gekrümmt wird von einer Krümmungsführung, und eine Speisevorrichtung für Stromleitdraht aufweist, der aufgewickelt wird in der vom Band gebildeten Rinne, die in die Rille der Drehtrommel eingelegt ist, bis sich der Stromleitdraht-Strang bildet, gekennzeichnet durch den Umstand, daß es einen Greifer (23) mit zwei Backen (110, 111) aufweist, die voneinander unabhängig sind und zu aufeinanderfolgenden Zeiten jeweils auf einen ersten (25) beziehungsweise auf einen zweiten seitlichen Rand (26) des Bandes (24) einwirken, und eine Verschweißungsvorrichtung (140 - 145 - 149) umfaßt, die unmittelbar hinter dem Greifer (23) vorgesehen ist, wobei eine Backe (110) nach abgeschlossener Bildung des Strangs (27') auf dem in der Rille (69) der Drehtrommel (20) liegenden Band einen seitlichen Rand (25) des Bandes (24) über den Strang (27') legt, wobei unmittelbar darauf die zweite Backe (111) die Innenseite des zweiten seitlichen Rands (26) des Bandes (24) auf die Außenseite des ersten, über dem Strang (27') liegenden, seitlichen Rands (25) zu liegen bringt, wobei unmittelbar darauf die Verschweißungsvorrichtung, die eine Andruckrolle (145) und ein Schweißrohr (140) für die Ausgabe von Heißluft aufweist, die Verschweißung der besagten so übereinandergelagerten seitlichen Ränder (25) und (26) ausführt.
2. Gerät zur automatischen Anfertigung von Entmagnetisierungsspulen wie unter Patentanspruch 1) beschrieben, gekennzeichnet durch den Umstand, daß mit dem Ende jeder der beiden Backen (110, 111) des Greifers (23) gelenkartig ein Arm (113, 114) verbunden ist, der von einer Feder (121, 122) und von einem innerhalb des Greifers (23) liegenden Endanschlag (123, 124) in Position gehalten wird, wobei an der Innenseite des besagten Arms (113, 114) ein Kopfstück (117, 118) vorgesehen ist, das mit einer Rille (118, 120) versehen ist, die nahezu geformt ist wie ein nahezu 90° umspannender Kreisbogen, wobei das weiter innen beim Greifer (23) liegende Ende (118', 120') des besagten Kreisbogens im wesentlichen in einem 90°-Winkel zur Seite (113',

114') des Arms (113, 114) steht, während das andere, zum Ende der Backe (110, 111) hin gerichtete Ende im wesentlichen parallel zur besagten Seite (113', 114') ausgerichtet ist, so daß bei immer größerer Annäherung einer Backe an die Drehtrommel (20) ihr jeweiliger Arm (113, 114) aufgrund des Kontaktes seines Endes mit der Seite der Drehtrommel zum Rotieren gezwungen wird und dabei den Widerstand der Feder (121, 122) überwindet, während die Rille (118, 120) des Kopfstücks (117, 119) sich drehend dem Strang (27') annähert, wodurch der seitliche Rand (25, 26) des Bandes (24) gekrümmt und zu selbigem hingezogen wird.

3. Gerät zur automatischen Anfertigung von Entmagnetisierungsspulen wie unter Patentanspruch 1) beschrieben, gekennzeichnet durch den Umstand, daß die Drehtrommel (20) aus zwei Scheiben (21, 22) besteht, wovon eine (21) an der Antriebswelle (30) befestigt ist und die andere (22) frei ist, sich von der ersten (21) zu lösen und unter der Einwirkung eines speziellen Getriebes wegzubewegen, wobei sie aber mitgenommen wird durch die Drehung der Welle (30), wobei diese Ablösung das Ausladen der Entmagnetisierungsspule (29) ermöglicht, da das Ende eines Zapfens drehend nah beim Rand der an der Welle (30) befestigten Scheibe (21) verankert ist, während das andere Ende über die bewegliche Scheibe (22) einen rechtwinkligen Kleinarm (65) trägt, der durch Einwirkung einer Feder (67) Berührung mit einem Nocken (62) hat, welcher mit der besagten letzteren Scheibe (22) verbunden ist, wobei beim Zapfen (61) auf Höhe einer Ausparung (88, 89) der Rille (69) der Drehtrommel (20) ein Spenrzahn (68) vorgesehen ist, der entgegen seiner Bewegungsrichtung ausgerichtet und zur Innenseite der Rille (69) geneigt ist, um das Einhaken des Bandes (24) zu erleichtern, wodurch beim Öffnen der Drehtrommel (20), das heißt beim Entfernen der beweglichen Scheibe (22) von der unbeweglichen Scheibe (21), durch die Einwirkung des Nockens (62) auf den Kleinarm (65) die Drehung des Zapfens (61) und folglich die Neigung des Sperrzahns (68) zur Außenseite der Drehtrommel (20) hin bewirkt wird, so daß das Aushaken der fertiggestellten Spule (29) leichter ausgeführt werden kann.

4. Gerät zur automatischen Anfertigung von Entmagnetisierungsspulen wie unter Patentanspruch 1) beschrieben, gekennzeichnet durch den Umstand, daß nach dem Einhaken des Bandes (24') und des Stromleitdrahtes (27) an

der Drehtrommel (20) und nach Ausführung nahezu einer Umdrehung selbiger sowie nach Durchtrennung des besagten Bandes (24') an einer Stelle, die einen ausreichenden Überstand des bei der Drehtrommel (20) eingehakten Endes erlaubt, der Automatikzyklus gestartet wird, der darin besteht, daß nach und nach der Strang (27') in der Rille (69) des Bandes (24') gebildet wird, daß der Greifer (23) zur Krümmung der seitlichen Ränder (25, 26) des Bandes (24') um den Strang (27') herum aktiv wird, daß die Verschweißungsvorrichtung mit der Andruckrolle (145) und dem Schweißrohr (140) aktiv wird, daß die Umdrehung vollendet wird, die zur Bildung und Verschweißung des Mantels (24'') um die gesamte Entmagnetisierungsspule (29) erforderlich ist, und daß das Gerät (11) zum Stillstand kommt, wobei der besagte Zyklus von einer elektronischen Steuereinheit (15) geregelt und kontrolliert wird, die eine Programmervorrichtung und verschiedene Kontroll- und Informationsvorrichtungen (80, 81, 82, 83, 84, 85, 86) umfaßt und mit verschiedenen Meßfühlern verbunden ist, die die Freigabe für die Betätigung der zweiten Backe (111) des Greifers (23) besorgen, nachdem die erste (110) die Krümmung des ersten seitlichen Rands (25) des Bandes (24') bewirkt hat, für die Annäherung der Andruckrolle (145) an die Drehtrommel (20), wenn die zweite Backe (111) die Krümmung des zweiten seitlichen Rands (26) des Bandes (24') bewirkt hat, für den Betrieb des Schweißrohrs (140), wenn die Andruckrolle ihren Verfahrensweg beendet hat, und für das Öffnen der Drehtrommel (20) zum Ausladen der Entmagnetisierungsspule (29), nachdem diese fertiggestellt worden ist.

## Revendications

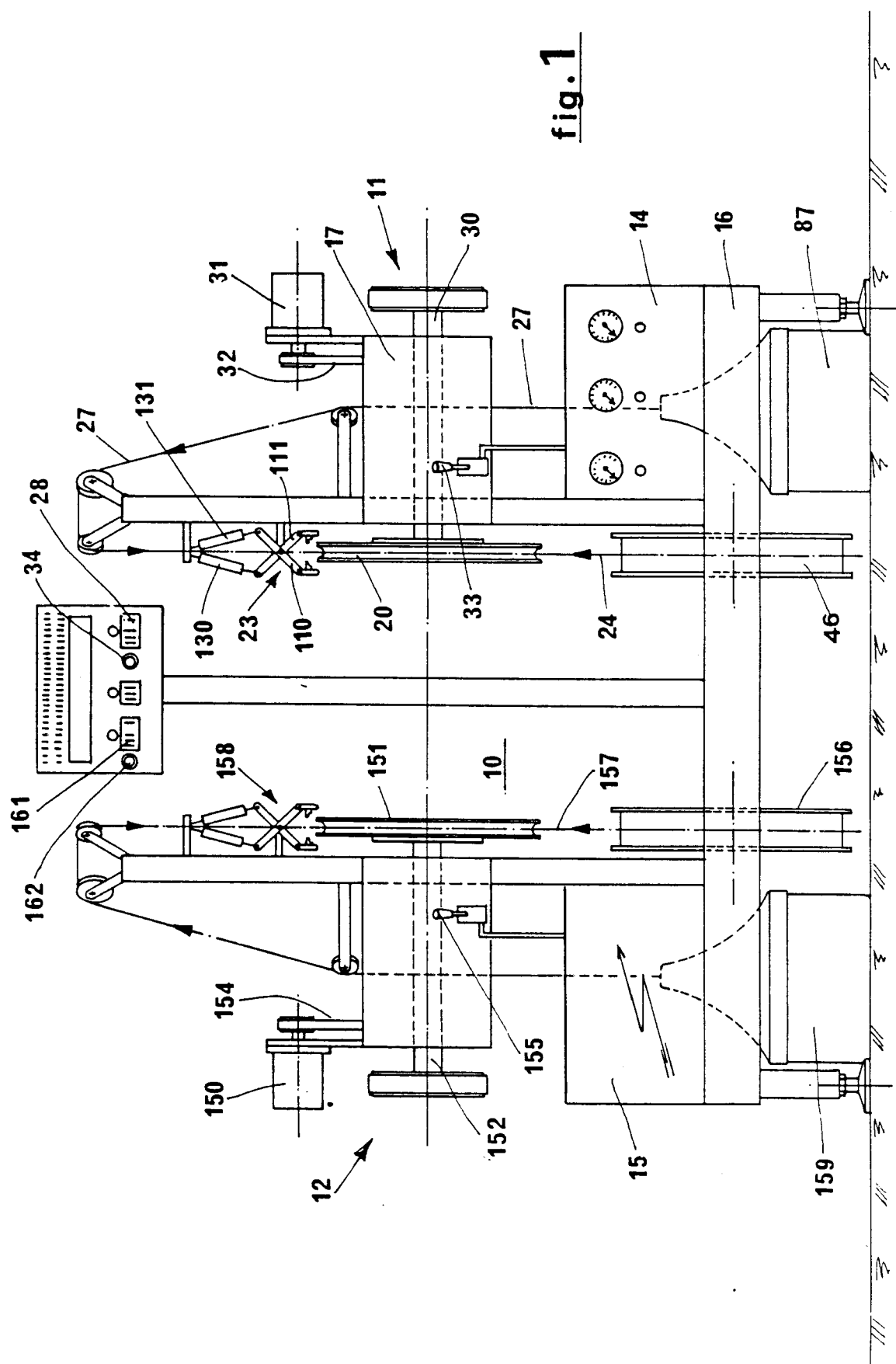
1. Appareil pour la formation automatique des bobines de démagnétisation formées par un écheveau de fil électrique revêtu d'une gaine en matière plastique, cet appareil comprenant un tambour rotatif muni d'une gorge périmétrale dans laquelle est logée une bande en matière plastique qui se courbe longitudinalement au fur et à mesure, en guise de goulotte, au moyen d'une glissière façonneuse, et comprenant aussi un alimentateur de fil électrique qui s'enroule sur la goulotte formée par la bande introduite dans la gorge du tambour jusqu'à la formation de l'écheveau de fil électrique, caractérisé par le fait qu'il comprend une pince (23) avec deux mâchoires (110), (111), réciproquement indépendantes et agissant en des temps successifs respectivement sur un bord (25) et sur l'autre bord (26) de la bande (24) et

comprend un dispositif (140-145-149) de soudage placé immédiatement après la pince (23), l'une des mâchoires (110) se chargeant, après la formation de l'écheveau (27') sur la bande logée dans la gorge (69) du tambour (20), de superposer un bord (25) de la bande (24) à l'écheveau (27'), la deuxième mâchoire (111) se chargeant immédiatement après de superposer la face interne du deuxième bord (26) de la bande (24) sur la face externe du premier bord (25) superposé à l'écheveau (27'), tandis que le dispositif de soudage, comprenant un rouleau (145) de pression et un chalumeau (140) pour la distribution de l'air chaud, effectue immédiatement après la soudure des deux bords (25) et (26) ainsi superposés.

2. Appareil pour la formation automatique des bobines de démagnétisation, comme dans la revendication 1), caractérisé par le fait qu'à l'extrémité de chacune des deux mâchoires (110), (111) de la pince (23) est articulé un bras (113), (114) maintenu dans sa position par un ressort (121), (122) et par un fin de course intérieur à la pince (23), ce bras (113), (114) comportant, fixée dans sa partie intérieure, une petite tête (117), (119) munie d'une gorge (118), (120) façonnée à peu près selon un arc de cercle s'étendant sur 90° environ, l'extrémité (118') (120') de cet arc plus intérieure à la pince étant pratiquement à 90° de la partie latérale (113') (114') du bras (113) (114), l'autre extrémité, tournée vers l'extrémité de la mâchoire (110), (111) étant pratiquement parallèle à cette partie latérale (113') (114') de telle sorte que, au fur et à mesure qu'une mâchoire s'approche du tambour (20), son bras (113), (114), par suite du contact de son extrémité avec la partie latérale du tambour, est obligé de tourner, en surmontant la résistance du ressort (121), (122) tandis que la gorge (118), (120) de la petite tête (117), (119) s'approche, en tournant, de l'écheveau (27') en courbant et en entraînant vers ce dernier le bord (25), (26) de la bande (24'),
3. Appareil pour la formation automatique des bobines de démagnétisation, comme dans la revendication 1), caractérisé par le fait que le tambour (20) est formé par deux disques (21), (22), l'un (21) fixé à l'arbre (30) moteur et l'autre (22) libre de se détacher du premier (21) en se déplaçant sous l'action d'un cinématisme approprié mais entraîné dans la rotation de l'arbre (30), ce détachement permettant le déchargement de la bobine (29) de démagnétisation, l'extrémité d'un petit pivot étant ancrée à proximité du bord du disque (21) fixé

à l'arbre (30), tandis que l'autre extrémité, après avoir traversé le disque (22) qui se déplace, supporte un petit bras (65) orthogonal placé en contact avec une came (62) solidaire de ce dernier disque (22) sous l'action d'un ressort (67), un crampon (68) étant prédisposé sur le petit pivot (61) vis-à-vis d'une courbe (88), (89) de la gorge (69) du tambour (20), ce crampon étant tourné dans le sens opposé à son mouvement et incliné vers l'intérieur de la gorge (69) de manière à faciliter l'accrochage de la bande (24) en provoquant, lorsque le tambour (20) est ouvert, c'est-à-dire lorsque le disque (22) qui se déplace est éloigné du disque (21) fixe, sous l'action de la came (62) sur le petit bras (65), la rotation du petit pivot (61) et par suite l'inclinaison du crampon (68) vers l'extérieur du tambour (20) de manière à faciliter le détachement de la bobine achevée (29).

4. Appareil pour la formation automatique des bobines de démagnétisation, comme dans la revendication 1), caractérisé par le fait que, après avoir accroché la bande (24') et le fil (27) électrique au tambour (20), lorsque ce dernier a accompli presque un tour et que la bande (24') a été coupée à un endroit lui permettant de surmonter suffisamment l'extrémité accrochée au tambour (20), le cycle automatique est acheminé procédant tour à tour à la formation de l'écheveau (27') dans la gorge (69) de la bande (24'), à l'intervention de la pince (23) pour la courbure des bords (25) (26) de la bande (24') autour de l'écheveau, (27') à l'intervention du dispositif de soudage avec rouleau (145) de pression, et chalumeau (140), à l'achèvement du tour nécessaire à la formation et à la soudure de la gaine (24'') sur toute la bobine (29) de démagnétisation et à l'arrêt de l'appareil (11), ce cycle étant commandé et contrôlé par une petite centrale électronique (15) comprenant un programmeur et différents dispositifs (80, 81, 82, 83, 84, 85, 86) de contrôle et d'information, reliée à divers senseurs qui se chargent de donner l'accord pour l'actionnement de la deuxième mâchoire (111) de la pince (23) lorsque la première (110) a déterminé la courbure du premier bord (25) de la bande (24'), à l'approche du rouleau (145) de pression au tambour (20) lorsque la deuxième mâchoire (111) a déterminé la courbure du deuxième bord (26) de la bande (24'), au fonctionnement du chalumeau (140) de soudage lorsque le rouleau (145) de pression a achevé sa course, à l'ouverture du tambour (20) pour le déchargement de la bobine (29) de démagnétisation lorsque celle-ci a été achevée.



**fig. 1**

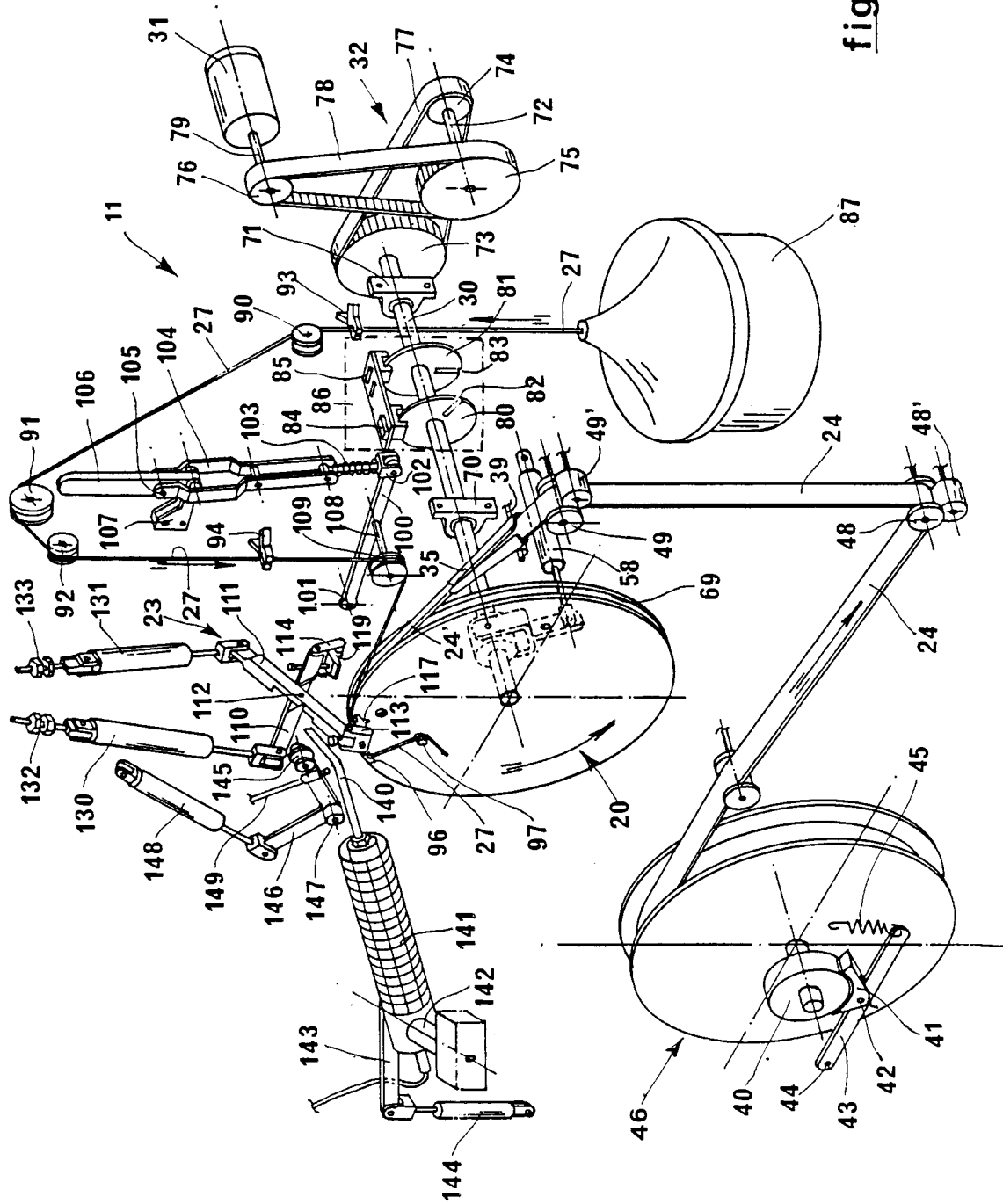


fig. 2

**fig. 3**

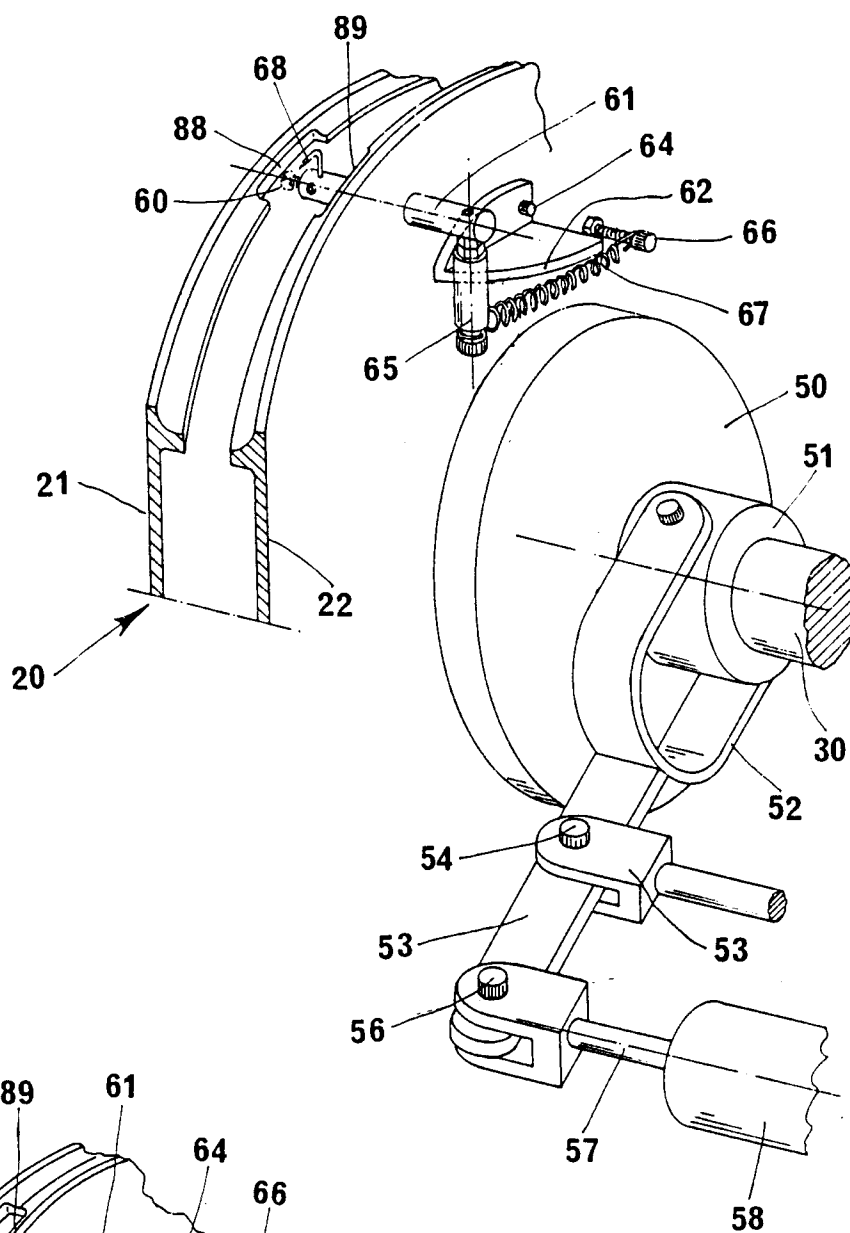
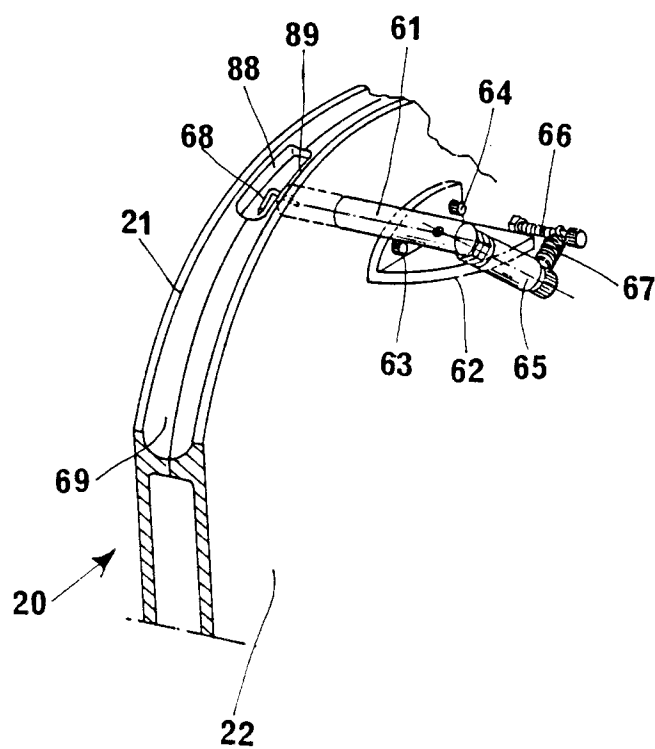
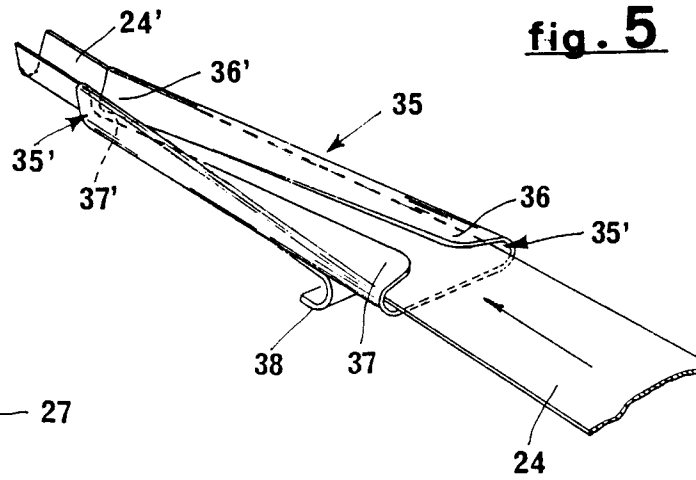


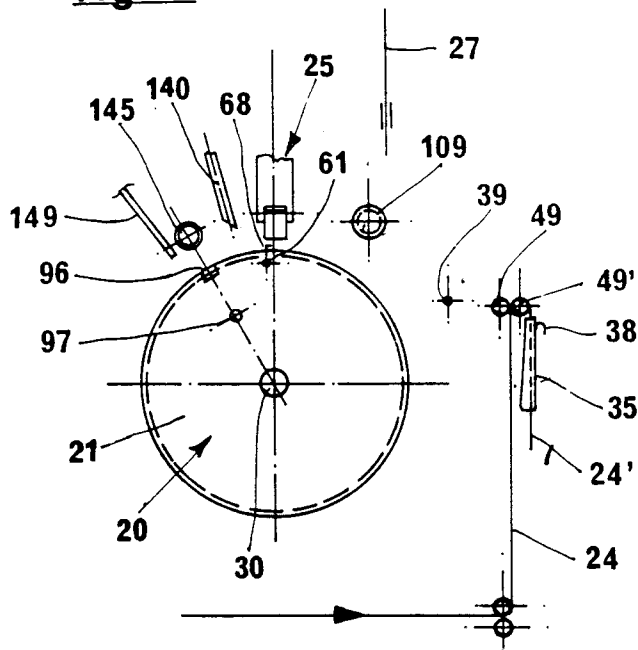
fig. 4



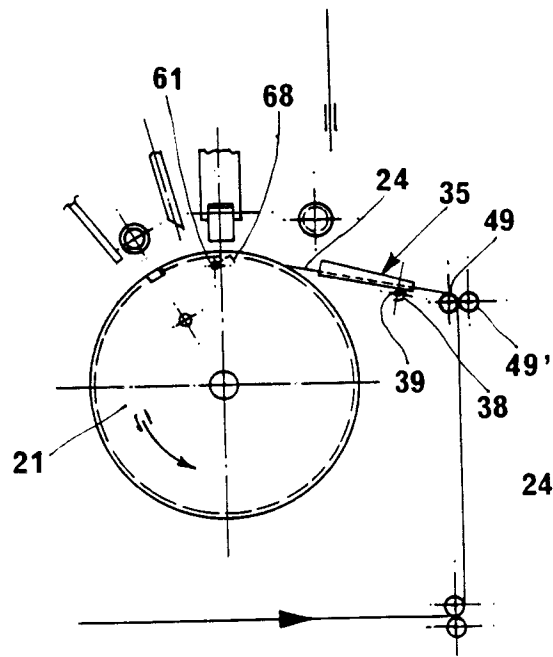
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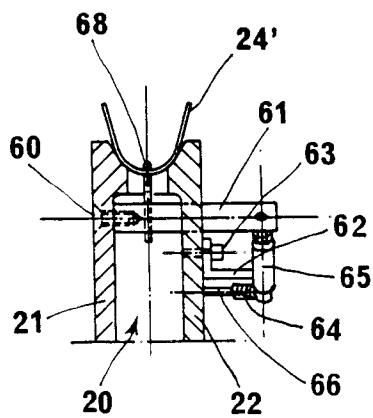
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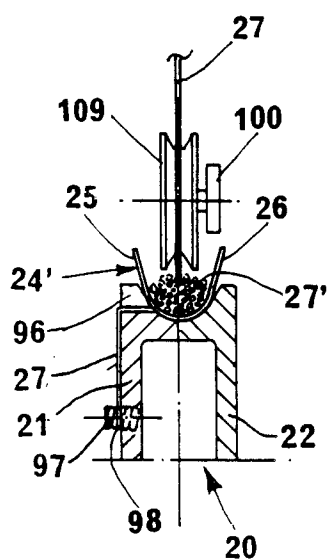
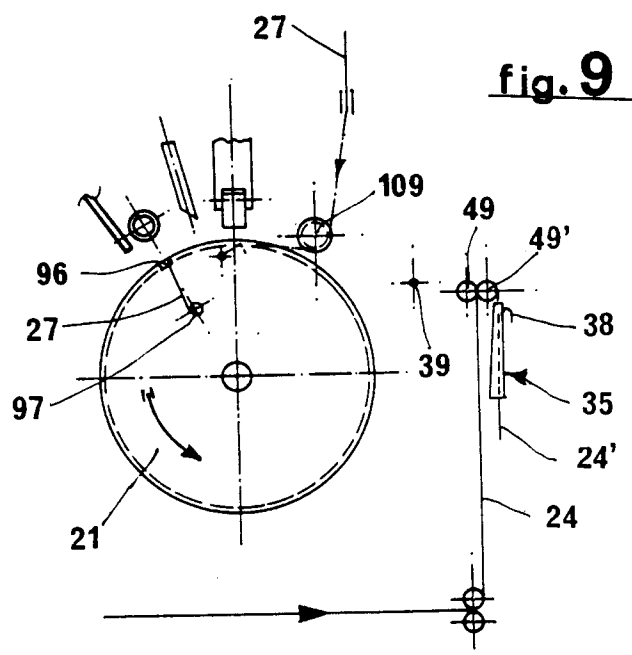


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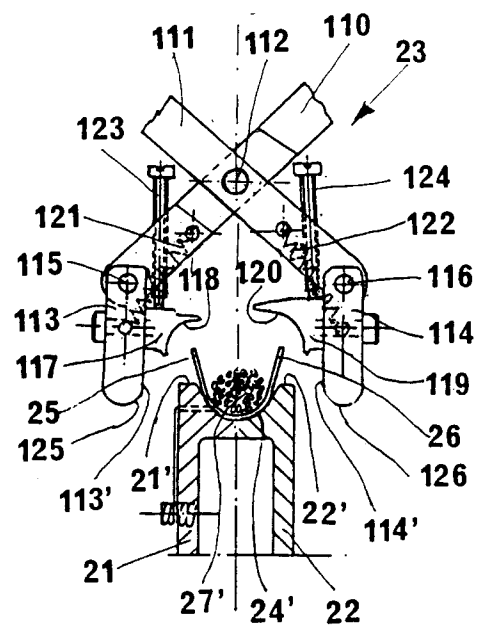


**fig. 8**

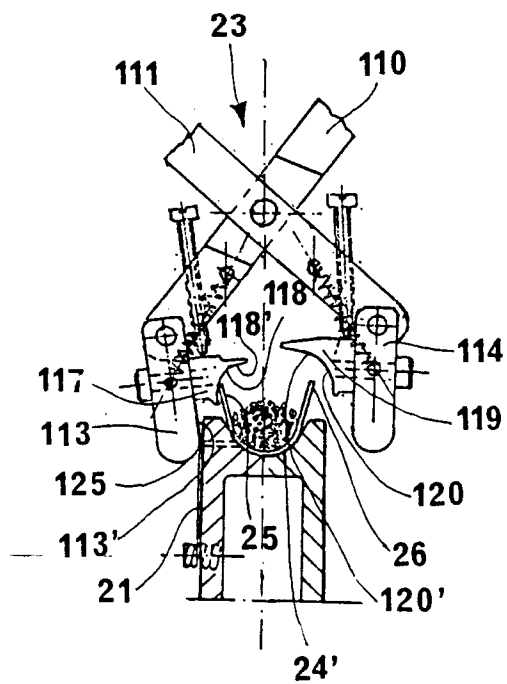




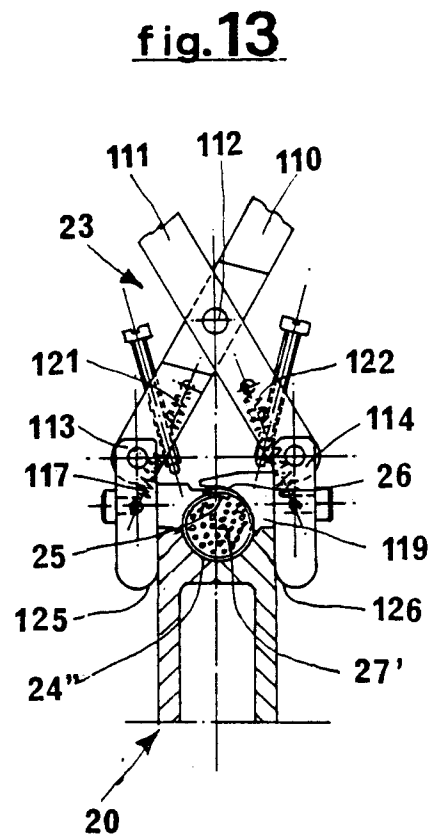
**fig.10**



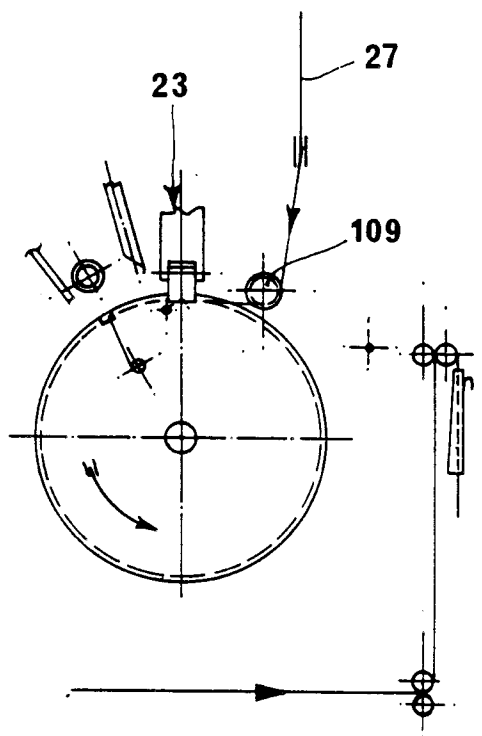
**fig.11**



**fig.12**



**fig.13**



**fig.14**

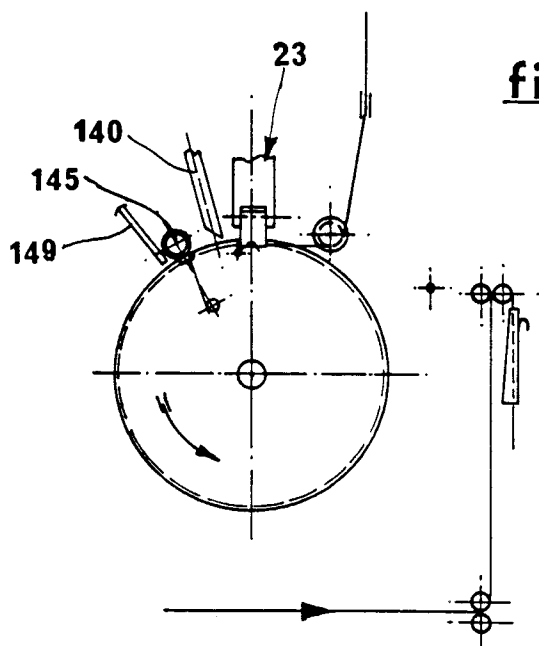


fig.15

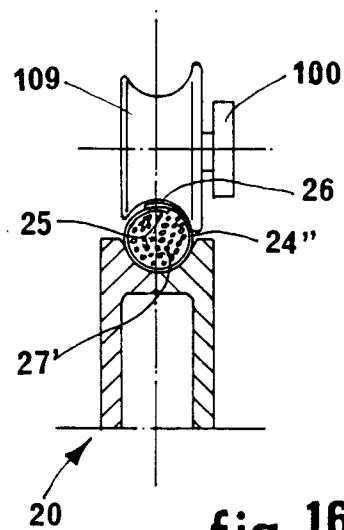


fig.16

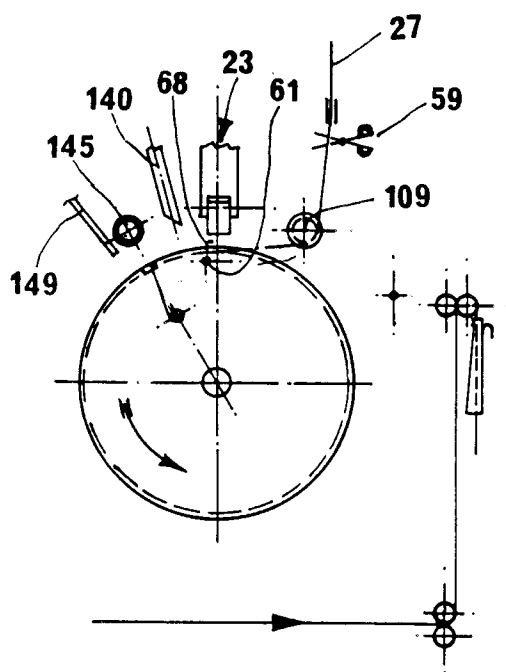


fig.17

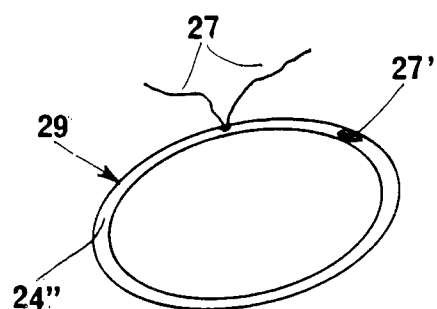


fig.18