(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 0 928 695 B1

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
17.12.2003 Bulletin 2003/51

(51) Int Cl.[7]: **B41J 2/315**

(21) Application number: **99200018.2**

(22) Date of filing: **05.01.1999**

(54) **Heat transfer printing device**

Thermotransferdruckgerät

Appareil d'impression par transfert de chaleur

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

(30) Priority: **09.01.1998 ES 9800025**

(43) Date of publication of application:
14.07.1999 Bulletin 1999/28

(73) Proprietor: **ITW ESPANA, SA**
08520 Les Franqueses del Valles(Barcelona) (ES)

(72) Inventor: **Cinca Teijeiro, Erika**
08960 Sant Just Desvern, Barcelona (ES)

(74) Representative: **Carpintero Lopez, Francisco et al**
HERRERO & ASOCIADOS, S.L.
Alcalá, 35
28014 Madrid (ES)

(56) References cited:
EP-A- 0 487 312
JP-A- 9 131 944
US-A- 5 675 369

Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

EP 0 928 695 B1

Description

OBJECT OF THE INVENTION

[0001] The invention in question refers to a heat transfer printing device, whose purpose is to allow the stamping at a higher speed, and with greater smoothness.

[0002] The invention is applicable, for example, to the stamping of plastic films with bar codes or any other type of data.

BACKGROUND OF THE INVENTION

[0003] The prior art describes the use of heat transfer printers that comprise a plurality of carriages in each one of which is supported a thermal head by means of which the stamping of different characters on a strip is carried out.

[0004] In order to permit this stamping, the conventional devices have a dye tape roll that runs over the surface of the strip and the head, in such a way that the used tape is rewound on a roller pulled by a motor.

[0005] The carriages are located on some guides along which they move by means of a spindle, likewise moved by a motor.

[0006] In order to carry out the stamping ascending/descending means of the heads have been provided for, which also have the function that once the dye tape has been used, the ascent of the heads makes it possible to remove the used dye tape, and therefore, permits replacement of the rolls by others with a new dye tape.

[0007] Besides, the inclusion of means that make it possible to carry out the detachment of the dye tape from the surface of the strip, after printing has been provided for.

[0008] On the other hand, self-centering means of the head on the surface to be stamped are included.

[0009] In this type of devices the ascending/descending path that the heads must have, have to be sufficient to allow the withdrawal and refilling of the dye tape, once it has been used up, for which purpose in order to carry out the different printings on the strip, the path of the head is considerable, in contrast to the distance that would be necessary to carry out the stamping.

[0010] The ascending/descending means of the heads are defined by a cylinder that moves the head, for which purpose, as the head has to run an excessive distance, the cylinder is forced to drive the head at a great speed, in such a way that when the head knocks against the surface to be printed for printing purposes, it makes a too strong impact which is not good either for the heads or for the printing, and besides, it can cause maladjustment and greater wear of the device.

DESCRIPTION OF THE INVENTION

[0011] In order to solve the above mentioned inconveniences, the invention consists of a heat transfer printing device that is characterized in that the head ascending/descending means in order to carry out the stamping and to allow replacement of the heads, are defined by a first ascending/descending means that is related to a second ascending/descending means in which the head is indirectly fixed; all in such a way that the operation of the first ascending/descending means approaches the second ascending/descending means, and therefore approaches the head, the dye tape and in this position the second ascending/descending means is operated in order to carry out the stamping, so that the path necessary to carry out the stamping is minimal, as the head is close to the dye tape. This characteristic allows the increase of the stamping speed at the same time that the impact produced by the head in the impact against the surface is considerably reduced upon contacting with the dye tape and the strip to be stamped.

[0012] On the other hand, when the dye tape is to be replaced, once the same has been used up, both ascending/descending means are deactivated whereby the head is separated from the dye tape at a distance equal to the sum of the path of the first ascending/descending means plus the path of the second ascending/descending means, whereby there is enough space to allow replacement of the dye tape.

[0013] The first ascending/descending as well as the second ascending/descending means are defined by a cylinder in such a way that both cylinders are related to each other, directly or indirectly and besides the shaft of the second cylinder is connected to the support of the thermal head. A direct relationship between cylinders is defined by the connection of their shafts.

[0014] The second cylinder is integral to a movable part, located upon some guides, that is related to the thermal head support in order to permit its movement when the first cylinder is operated.

[0015] Therefore, there is also the possibility that the shaft of the first cylinder is connected to the movable part (indirect relationship), in order to carry out the above mentioned function referring to the removal of the dye tape, and stamping of the strip.

[0016] The first cylinder is integral to a support in which some guides are included upon which the movable part runs; the support also being integral to the carriage, in such a way that they form an assembly.

[0017] Another characteristic of the invention is the fact that the dye tape holder rolls are located in a detachable frame, in which there are also the corresponding fastening shaf t of the rolls and guiding shaf t of the dye tape. This structure has the advantage that in order to replace the used tape, the frame is removed and then the rolls are replaced by passing the tape over the corresponding guides provided in the frame, in such a way that the replacement function of the dye tape is considerably simplified.

[0018] In order to allow the coupling of the frame to the device, the frame as well as the device have complementary self-centering devices defined by a series of

centering tubes, in which the corresponding centering stubs are inserted.

[0019] Besides, the pull shaft of the dye tape holder rolls has automatic clutching means with the traction motor upon the detachable frame coupling to the device.

[0020] Said clutching means are defined by a longitudinally movable shaft that is aided by a spring which close to its end includes some radial fins that by action of the spring, are inserted into a groove made in the pull shaft of the frame when the motor rotates.

[0021] In order to achieve this function, the movable shaft along with the radial fins are provided for on the inside of a tube-shaped body in whose bottom has been provided a spring after which is located the end of the movable shaft. The radial fins project laterally with regard to the tube-shaped body, for which purpose it has a longitudinal groove along which the radial fins move, whose end position is delimited by a stop provided for in the tube-shaped body.

[0022] Hence, upon the detachable frame coupling to the device, the tube-shaped body is inserted in the pull shaft of the frame, in whose operation the radial fins move along the groove provided for in the tube-shaped body until the perfect coupling of the detachable frame in the device takes place; in such a way that as the motor operates, and therefore the pull shaft, the rotation of the latter makes the radial fins coincide, with the grooves of the pull shaft of the frame, and by the action of the spring the fins are inserted in the groove of the pull shaft, carrying out the perfect interlocking automatically.

[0023] Another characteristic of the invention is the fact that the self-centering means of the head to the surface to be stamped, are defined by a projection provided for on the movable part, mentioned above, that is located between two projections provided for on the thermal head support, in such a way that the three projections are passed through by a shaft in which the head support tilts upon contacting with the strip to be printed, the self-centering of the thermal head being carried out during stamping.

[0024] Hereinafter to provide a better understanding of this specification and forming an integral part hereof, a series of figures in which the object of the invention has been represented in an illustrative and non-restrictive manner, are attached hereto.

BRIEF DESCRIPTION OF THE FIGURES

[0025]

Figure 1 shows a general schematic raised view of the heat transfer printing device, in which two thermal heads have been provided for, one schematically in the stamping position, and the other more detailed one in the raised position. This figure exclusively represents the fastening and guiding shafts of the tape included in the detachable frame, for the purpose of clearly showing the operation of the device.

Figure 2 shows a raised view of the detachable frame, removed from the device, and prepared for replacement.

Figure 3 shows a schematic rear raised view of the device of the invention once the detachable module holding the dye tape rolls has been removed.

Figure 4 shows a schematic partially sectioned side view of the entire assembly that supports the head.

Figure 5 shows a schematic view of a thermal head in the inoperative position that permits removal and refilling of the detachable dye tape holder frame.

Figure 6 shows a schematic view equivalent to the previous one, but with the difference that the head is prepared for stamping, for which purpose the first cylinder has caused the descent of the position of the second cylinder.

Figure 7 shows a view equivalent to the two previous ones, but with the difference that the head is in the stamping position.

Figure 8 shows a partially sectioned view of the means that permit the automatic clutching of the pull shaft in the pick-up roll of the used dye tape.

DESCRIPTION OF AN EMBODIMENT OF THE INVENTION

[0026] Hereinafter a description is made of the invention based on the above mentioned figures.

[0027] The heat transfer printing device has two guides (1) along which slide the carriages (2) along which also runs a spindle (3), that is operated by a motor that allows the movement of the carriages (2) on the guides (1), and thus allows transversal movement in order to carry out the stamping.

[0028] The movement of the carriages (2) on the guides (1) is controlled by means of a motor that governs the rotation of the spindle (3).

[0029] A support (5) which includes some guides (6) along which runs a movable part (7) has been provided for on the carriage (1).

[0030] A first cylinder (8) has been fixed to the support (5), the shaft being connected to a second cylinder (9), which in turn is integral to the movable part (7).

[0031] Besides, the cylinder (9) shaft is connected to a thermal head (4) support (10).

[0032] The support (10) has a certain slant to facilitate stamping, since the head used is a corner type one which carries out printing by sliding the longitudinal bottom edge on the to be printed.

[0033] Some dye tape (12) holder rolls (21) and (22) have been provided for on the top part of the device, by means of which the thermal head (4) carries out the stamping on a strip (13).

[0034] The new dye tape (12) is wound on the supply roll (21) and is guided to be located in correspondence with the strip to be printed (13), just as it will be explained hereinafter. The used dye tape is wound on the take up

roll(22), in such a way that once all the dye tape (12) is used up, replacement thereof is carried out by removing the rolls (21) and (22) , just as it will be described hereinafter.

[0035] Upon carrying out the printing, in such a way that will be described hereinafter, the connection of the dye tape (12) and strip to be printed (13) takes place, for which purpose one of the carriages (2) has an extension (23) that ends according to an arm (14) along whose bottom part runs the strip (13) to be printed and along whose top part runs the dye tape (12), so that after printing both of them separate from each other.

[0036] In order to allow the replacement of the dye tape (12), it is necessary for the head (4) to be separated somewhat from the dye tape, enough to allow removal thereof, for which purpose the first cylinder (8) and the second cylinder (9) are deactivated and therefore, their shafts are in the highest position. This circumstance has been represented in figure 6.

[0037] In the described position, the head (4) is separated too much from the dye tape (12), for which purpose if the printing is done from this position, the descending movement of the head (4) should take place very quickly, just as it is done conventionally, with the problems that this involves, just as it was already described in the "background of the invention."

[0038] In order to solve these problems, in the device of the invention, prior to stamping, the first cylinder (8) is activated, in whose descending movement of the shaft, causes the descending movement of the movable part (7), all guided on the guides (6). In the descending movement of the movable part (7), descending movement of the cylinder (9) is also produced, as it is integral to the former and given that its shaft is connected to the head (4) support (10), the head (4) approaches the dye tape (12) contacting with the same. In this position the stamping distance has considerably reduced, which in the embodiment is approximately half the movement of the total path provided by both cylinders (8) and (9).

[0039] Once the head (4) is in contact with the dye tape (12), it is ready to stamp, for which purpose the cylinder (9) is activated producing the descending movement of its shaft, whose movement pushes the head (4) pulling the dye tape (12) against the strip to be printed (13), carrying out the stamping, the dye tape (12) being connected to the strip to be printed (13) (figure 8), whose separation is materialized by means of the arm (14), just as it has been commented on above.

[0040] In the continuous printing operation only the second cylinder (9) is activated and deactivated in such a way that the path that the head has to run in order to achieve the different prints, is minimal, so that the stamping speed is increased and the printing is smoother given that upon having a shorter path, the impact that is produced when knocking against the surface is much less than if the distance were greater, as in conventional systems.

[0041] To facilitate the guiding of the movable part (7) in the guides (6), the movable part (7) has some turrets (11) along which the guides (6) run.

[0042] Besides the movable part (7) has a projection (16) that is located between two projections (17) provided for on the head (4) support (10), in such a way that the three projections are passed through by a shaft (18) in which tilts the head (4) support (10) upon contacting with the strip to be printed (13); carrying out the self-centering of the head with respect to the strip.

[0043] Another characteristic of the invention is the fact that in order to allow replacement of the dye tape (12), a detachable frame (19) has been provided for in which are included the corresponding shafts to support the supply roll (21) and the take up roll (22) as well as the corresponding guiding shafts of the dye tape (12).

[0044] This structure has been represented in figure 2, and allows the replacement of the dye tape (12), simply by removing the detachable frame (19), with which the supply roll (21) and the take up roll (22) are also removed, the used dye tape (12) being wound on the latter roller.

[0045] Once the detachable frame (19) has been removed, the rolls (21) and (22) may be replaced, by rolls with a new dye tape (12), in such a way that afterwards the detachable frame (19) is placed on the device, for which purpose the device has been provided with a series of centering tubes (25) while the detachable frame (12) has been provided with some centering stubs (20), in such a way that in order to assemble the detachable frame (19) on the device, some centering stubs (20) have been inserted into the centering the tubes (25), achieving in this way the perfect coupling in the device, and the perfect positioning of the dye tape with respect to the heads (4) and the strip to be printed (13).

[0046] Upon coupling the detachable frame (19) to the device, and given that the motor and the pull shaft (37) are located in the device, it is essential that the perfect coupling with the pull shaft (26) of the take up roll (22) takes place. In order to achieve this function, the device, aside from the already described self-centering, includes a bushing (30) in which is retained the pull shaft (37) by means of some bearings (31) that permit the free rotation thereof.

[0047] The shaft (37) is defined by means of a tube-shaped body inside of which is housed a spring (32) on which rests a longitudinally movable shaft (33) in whose end some radial fins (34) are included.

[0048] Said radial fins (34) extend laterally with respect to the tube-shaped body (37) for which purpose a transversal groove has been made in said body, and besides it includes a stop (35) that fits in a recess provided for in the radial fins (34), to prevent the fins from coming out, through the grooves of the tube-shaped body (37).

[0049] Besides, the tube-shaped body (34) ends in a conical section (36) that facilitates coupling thereof in a bushing (28) provided for in the pull shaft (26) of the take up roll (22).

[0050] The bushing (28) is likewise provided with

some transversal grooves (29), in such a way that if upon introducing the conical portion (36) of the tube-shaped body (37) in the bushing (28), the radial fins (34) do not coincide with the grooves (29), the pushing of the radial fins, that run along the transversal grooves provided for in the tube-shaped body (37), is produced, this all overcoming the action of the spring (32) upon pushing the shaft (33) longitudinally movable along the shame.

[0051] In this situation, upon the motor starting up and therefore the rotation of the pull shaft (37) being produced, the rotation of the radial shafts (34) is also produced. Upon these fins being in correspondence with the grooves (29) , they are inserted in the same by the action of the spring (32), until being located in the bottom of said grooves, in such a way that the perfect coupling and clutching of the tube-shaped body (37) are obtained with the pull shaft (26) of the take up roll (22), and this being done automatically.

Claims

1. Heat transfer printing device, that comprises:

- a plurality of carriages (2) supporting a thermal head (4), for stamping different characters, on a strip (13);
- a supply roll (21) of dye tape to be used, which runs along the surface of the strip to be printed (13) and the head (4);
- a take-up roll (22) of the used dye tape which is pulled by a motor;
- some guides (1) along which move the carriages (2) by means of a spindle (3) moved by a motor;
- ascending/descending means of the heads to carry out the stamping and to allow replacement of the rolls (21, 22), by others with a new dye tape (12), after the entire dye tape has been used up;
- detachment means (14) of the dye tape (12) from the surface of the strip (13) after carrying out the printing;
- self-centering means of the head upon the surface to be stamped;

characterized in that the ascending/descending means of the heads (4) in order to carry out the stamping and to allow replacement of the rolls (21, 22) are defined by a first ascending/descending means that is related to a second ascending/descending means in which is indirectly fixed the head (4); in such a way that the operation of the first ascending/descending means approaches the second ascending/descending means, and therefore the head, to the dye tape (12); and in this position the second ascending/descending means is activated to carry out the stamping; while the deactivation of both means maintains the head separated from the dye tape a distance equal to the sum of the path of the first ascending/descending means plus the path of the second ascending/descending means; allowing the replacement of the dye tape.

2. Heat transfer printing device, according to claim 1, **characterized in that** the first and second ascending/descending means are defined by respective cylinders (8 and 9) in such a way that the first cylinder (8) shaf t is connected to the second cylinder (9), and the shaft thereof is connected to the thermal head (4) support (10).

3. Heat transfer printing device, according to the above claims, **characterized in that** the second cylinder (9) is integral to a movable part (7), placed upon some guides (6), this part being related to the thermal head (4) support (10), in order to allow movement thereof upon the first cylinder (8) being activated.

4. Heat transfer printing device, according to the above claims, **characterized in that** the first cylinder (8) shaft is connected to the movable part (7).

5. Heat transfer printing device, according to the above claims, **characterized in that** the first cylinder (8) is integral to a support (5) in which are included the guides (6) upon which runs the movable part (7) for which purpose the guides have been provided with some turrets (11) through which the guides (6) run; the support (5) also being integral to the carriage (2).

6. Heat transfer printing device, according to claim 1, **characterized in that** the rolls (21, 22) supporting the dye tape (12), are located in a detachable frame (19) that includes the corresponding fastening shafts of the rollers, and guiding shafts of the dye tape (12), in such a way that in order to carry out the replacement of the used dye tape (12) , the detachable frame (19) is removed.

7. Heat transfer printing device, according to claim 6, **characterized in that** the pull shaft (26) of the take-up roll (22), located in the detachable frame (19), has automatic clutching means with the pull shaft (37), provided for in the device and activated by the traction motor, upon coupling the detachable frame (19) to the device.

8. Heat transfer printing device, according to the previous claim, **characterized in that** the clutching means are defined by a longitudinally movable shaft (33), aided by a spring (32) whose end includes some radial fins (34), which by the action of the

spring (32), are inserted in some grooves (29) made in the pull shaft (26) of the take-up roll (22), upon the motor rotating.

9. Heat transfer printing device, according to claims 7 and 8, **characterized in that** the pull shaft (37) is defined by a tube-shaped body in the inside and bottom of which is housed the spring (32) which presses on the longitudinally movable shaft (33), whose radial fins (34) project laterally which respect to the tube-shaped body, for which purpose in said body has been made a longitudinal groove that permits longitudinal movement thereof and whose end position is delimited by a stop (35); it being provided for that at least the end of the pull shaft (26) of the take-up roll (22) is hollow in order to allow insertion of the end (36), preferably conical, of the tube-shaped body (37), said hollow section having grooves (29) for insertion of the radial fins (34); in such a way that upon carrying out the coupling of the detachable frame (19), longitudinal movement of the radial fins is produced upon contacting with the edge of the pull shaft (26) of the detachable frame (19), in such a way that upon the motor rotating and the radial fins (34) coinciding with the grooves (29), insertion and automatic clutching thereof are produced.

10. Heat transfer printing device, according to claim 6, **characterized in that** the device as well as the detachable frame (19) have self-centering means that are defined by a series of centering stubs (20) provided for on the detachable frame (19) that are inserted in a series of centering tubes (25) provided for in the device.

11. Heat transfer printing device, according to claim 1, **characterized in that** the self-centering means of the head (4) upon the strip to be printed (13), are defined by a projection (16) provided for in the movable part (7) that is located between two projections (17) provided for in the head (4) support (10), in such a way that the three projections (16 and 17) are passed through by a shaft (18) on which the head (4) support (10) tilts upon contacting with the strip to be printed (13), carrying out the self-centering.

Patentansprüche

1. Thermotransferdruckgerät, die Folgendes umfasst:

- eine Vielzahl an Wagen (2), die einen Thermokopf (4) aufnehmen, der für den Druck verschiedener Zeichen auf einem Streifen (13) angebracht ist;
- eine Befüllungsspule (21) mit zu benutzendem Lösungsband, das an der Oberfläche des zu druckenden Streifen (13) und des Kopfs (4) entlangläuft;
- eine Aufwickelspule (22) des gebrauchten Lösungsbands, das von einem Motor gezogen wird;
- einige Führungen (1), auf denen die Wagen (2) mittels einer Spindel (3) entlanglaufen, die von einem Motor bewegt werden;
- sich aufwärts und abwärts bewegende Vorrichtungen der Köpfe, um den Druck auszuführen und das Austauschen der Spulen (21, 22) durch eine neue Spule mit Lösungsband (12) zu ermöglichen, nachdem das gesamte Lösungsband benutzt worden ist;
- Elemente zur Ablösung (14) des Lösungsbandes (12) von der Oberfläche des Streifens (13), nachdem der Druckvorgang beendet ist;
- Selbstzentrierende Vorrichtung des Kopfs auf der zu bedruckenden Oberfläche:

dadurch gekennzeichnet, dass die sich auf- und abwärts bewegenden Vorrichtungen des Kopfs (4) zur Ausführung des Drucks und um den Austausch der Spulen (21, 22) zu ermöglichen über eine erste sich auf-und abwärts bewegende Vorrichtung verfügen, die mit einer zweiten ebensolchen Einrichtung verbunden ist, an der indirekt der Kopf (4) befestigt ist; sodass die Betätigung der ersten sich auf- und abwärts bewegenden Vorrichtung die zweite Vorrichtung in Bewegung setzt und somit auch den Kopf in Richtung Lösungsband (12); in dieser Stellung wird die zweite sich auf- und abwärts bewegende Vorrichtung aktiviert, um zu drukken. Während die Desaktivierung beider Vorrichtungen den Kopf zum Lösungsband auf einer Distanz hält, die mit der Summe der Strecke übereinstimmt, die jeweils die erste sich auf- und abwärts bewegende Vorrichtung und die zweite sich auf-und abwärts bewegende Vorrichtung in ihrer Bewegung zurücklegen; ermöglicht dies den Ausstausch des Lösungsbands.

2. Thermotransferdruckgerät gemäss Anspruch 1, **dadurch gekennzeichnet, dass** die erste und zweite sich auf- und abwärts bewegende Vorrichtung durch jeweilige Zylinder (8 und 9) definiert sind, sodass die erste Zylinderwelle (8) mit der zweiten Zylinderwelle (9) verbunden ist, womit die Welle mit der Halterung (10) des Thermokopfs (4) verbunden ist.

3. Thermotransferdruckgerät gemäss einem der vorherigen Ansprüche, **dadurch gekennzeichnet, dass** der zweite Zylinder (9) in ein bewegliches Element (7) integriert ist, das auf Führungen (6) aufliegt, wobei dieses Element in Verbindung mit der Halterung (10) des Thermokopfs (4) steht, um eine

Aktivierung der Bewegung des ersten Zylinders (8) hiermit zu ermöglichen.

4. Thermotransferdruckgerät gemäss einem der vorherigen Ansprüche, **dadurch gekennzeichnet, dass** die Welle des ersten Zylinders (8) mit dem beweglichen Element (7) verbunden ist.

5. Thermotransferdruckgerät gemäss einem der vorherigen Ansprüche, **dadurch gekennzeichnet, dass** der erste Zylinder (8) in eine Halterung (5) integriert ist, die die Führungen (6) umfasst, auf denen das bewegliche Element (7) läuft. Zu diesem Zweck sind die Führungen mit mehreren Revolvern (11) versehen, durch die die Führungen (6) laufen; die Halterung (5) ist auch in die Wagen (2) integriert.

6. Thermotransferdruckgerät gemäss Anspruch 1, **dadurch gekennzeichnet, dass** die Spulen (21, 22), die das Lösungsband (12) aufnehmen, sich in einem abnehmbaren Rahmen (19) befinden, der die entsprechenden Verschlussstifte der Spulen und die Führungsstifte des Lösungsbands (12) umfasst, sodass das gebrauchte Lösungsband (12) durch Wegnehmen des abnehmbaren Rahmens (19) ausgetauscht werden kann.

7. Thermotransferdruckgerät gemäss Anspruch 6, **dadurch gekennzeichnet, dass** der Ziehstift (26) der Aufwickelspule (22), die sich in dem abnehmbaren Rahmen (19) befindet, über automatische Einrastungen für die Ziehstifte (37) verfügt, die in den Vorrichtungen vorgesehen sind und von dem Triebmotor aktiviert werden, wobei der abnehmbare Rahmen (19) mit der Vorrichtung gekoppelt ist.

8. Thermotransferdruckgerät gemäss dem vorigen Anspruch, **dadurch gekennzeichnet, dass** die Einrastungen durch einen länglichen beweglichen Stift (33) definiert sind, der durch eine Feder (32) unterstützt wird, dessen Ende speichenförmig angeordnete Rippen (34) aufweist, die bei Rotation des Motors durch Auslösen der Feder (32) in Rillen (29) eingeführt werden, die sich in dem Ziehstift (26) der Aufwickelspule (22) befinden.

9. Thermotransferdruckgerät gemäss den Ansprüchen 7 und 8, **dadurch gekennzeichnet, dass** der Ziehstift (37) durch einen röhrenförmigen Körper definiert ist, in dessen Inneren sich unten die Feder (32) befindet, die auf den länglichen beweglichen Stift (33) drückt, dessen speichenförmig angeordneten Rippen (34) seitlich zu dem röhrenförmigen Körper angeordnet sind, wofür in besagtem Körper längliche Rillen angelegt sind, die somit eine Längsbewegung ermöglichen und deren Endposition durch einen Anschlag (35) festgelegt ist; es ist dafür gesorgt, dass wenigstens das Ende des Ziehstifts (26) der Aufwickelspule (22) hohl ist, damit das bevorzugt konische Ende (36) des röhrenförmigen Körpers (37) eingeführt werden kann. Der besagte hohle Abschnitt verfügt über Rillen (29), um die speichenförmig angeordneten Rippen (34) aufzunehmen; sodass durch die Kopplung mit dem abnehmbaren Rahmen (19) eine Längsbewegung der speichenförmig angeordneten Rippen ausgelöst wird, wenn diese mit der Kante des Ziehstifts (26) des abnehmbaren Rahmens (19) in Berührung kommen. So kommt es aufgrund der Motorrotation und des Einführens der speichenförmig angeordneten Rippen (34) in die Rillen (29) zu einem automatischen Einrasten.

10. Thermotransferdruckgerät gemäss Anspruch 6, **dadurch gekennzeichnet, dass** sowohl die Vorrichtung als auch der abnehmbare Rahmen (19) über selbstzentrierende Elemente verfügen, die durch eine Reihe von Zentrierstutzen (20) auf dem abnehmbaren Rahmen (19) definiert sind, die in Zentrierrohre (25) eingeführt werden, die auf der Vorrichtung vorgesehen sind.

11. Thermotransferdruckgerät gemäss Anspruch 1, **dadurch gekennzeichnet, dass** die selbstzentrierenden Elemente des Kopfs (4) auf dem zu druckenden Streifen (13) durch einen Vorsprung (16) auf dem beweglichen Element (7) definiert sind, der sich zwischen zwei Vorsprüngen (17) befindet, die auf der Halterung (10) des Kopfs (4) angebracht sind, sodass durch die drei Vorsprünge (16 und 17) ein Stift (18) läuft, gegen den die Halterung (10) des Kopfs (4) durch den Kontakt zu dem zu druckenden Streifen (13) kippt und so die Selbstzentrierung durchführt.

Revendications

1. Appareil d'impression par transfert de chaleur, qui comprend:

- une pluralité de chariots (2) supportant une tête thermique (4) pour estamper différents caractères, sur une bande (13);
- - un tambour d'alimentation (21) d'un ruban encreur, qui défile le long de la surface de la bande à imprimer (13) et la tête (4);
- un tambour récepteur (22) du ruban encreur usagé qui est entraîné par un moteur;
- des guides (1) le long desquelles se déplacent les chariots (2) au moyen d'un arbre (3) mû par un moteur;
- des moyens de levage et de descente des têtes pour réaliser l'estampage et permettre le remplacement des tambours (21, 22) par des autres ayant un nouveau ruban encreur (12),

après l'utilisation complète du ruban encreur;

- des moyens de détachement (14) du ruban encreur (12) de la surface de la bande (13) après la réalisation de l'impression.
- des moyens d'auto-centrage de la tête sur la surface à estamper;

caractérisé en ce que les moyens de levage et de descente des têtes (4) pour réaliser l'estampage et pour permettre le remplacement des tambours (21, 22) sont définis par un premier moyen de levage et de descente qui est relié à un deuxième moyen de levage et de descente sur lequel est fixée indirectement la tête (4); de manière à ce que la mise en marche du premier moyen de levage et de descente rapproche le deuxième moyen de levage et de descente, et par conséquent la tête se rapproche du ruban encreur (12); et à cette position le deuxième moyen de levage et de descente est activé pour réaliser l'estampage; alors que la désactivation des deux moyens maintient la tête séparée du ruban encreur à une distance égale à l'addition de la course du premier moyen de levage et de descente plus la course du deuxième moyen de levage et de descente; en permettant le remplacement du ruban encreur.

2. Appareil d'impression par transfert de chaleur, selon la revendication 1, **caractérisé en ce que** le premier et le deuxième moyen de levage et de descente sont définis par les cylindres respectifs (8 et 9) de manière à ce que le premier arbre de cylindre (8) est connecté au deuxième cylindre (9) et son arbre est connecté au support (10) de la tête thermique (4).

3. Appareil d'impression par transfert de chaleur, selon les revendications précédentes, **caractérisé en ce que** le deuxième cylindre (9) est solidaire d'une pièce mobile (7), mise en place sur des guides (6), cette pièce étant reliée au support (10) de la tête thermique (4), pour permettre son mouvement lors de l'activation du premier cylindre (8).

4. Appareil d'impression par transfert de chaleur, selon les revendications précédentes, **caractérisé en ce que** l'arbre du premier cylindre (8) est connecté à la pièce mobile (7).

5. Appareil d'impression par transfert de chaleur, selon les revendications précédentes, **caractérisé en ce que** le premier cylindre (8) est solidaire d'un support (5) sur lequel sont inclus les guides (6) sur lesquelles défile la pièce mobile (7), en raison de quoi les guides sont pourvus de tourelles (11) à travers lesquelles défilent les guides (6); le support (5) étant également solidaire du chariot (2).

6. Appareil d'impression par transfert de chaleur, selon la revendication 1, **caractérisé en ce que** les tambours (21, 22) supportant le ruban encreur (12) sont situés dans un cadre amovible (19) qui inclut les arbres de serrage correspondants des tambours, et les arbres de guidage du ruban encreur (12), de manière à réaliser le remplacement du ruban encreur usagé (12), et le cadre amovible (19) est retiré.

7. Appareil d'impression par transfert de chaleur, selon la revendication 6, **caractérisé en ce que** l'arbre de transmission (26) du tambour récepteur (22), mise en place sur le cadre amovible (19), a des moyens à embrayage automatique avec l'arbre de transmission (37), aménagés dans le dispositif et activés par le moteur de traction, lorsque le cadre amovible (19) est accouplé au dispositif.

8. Appareil d'impression par transfert de chaleur, selon la revendication précédente, **caractérisé en ce que** les moyens d'embrayage sont définis par un arbre mobile longitudinalement (33), assisté par un ressort (32) dont l'extrémité inclut des ailettes radiales (34), qui par l'action du ressort (32), sont insérées dans des rainures (29) aménagées dans l'arbre de transmission (26) du tambour récepteur (22), lors de la rotation du moteur.

9. Appareil d'impression par transfert de chaleur, selon les revendications 7 et 8, **caractérisé en ce que** l'arbre de transmission (37) est défini par un corps tubulaire à l'intérieur et au fond duquel est logé le ressort (32) qui presse sur l'arbre mobile longitudinalement (33), dont les ailettes radiales (34) se projettent latéralement par rapport au corps tubulaire, en raison de quoi une rainure longitudinale a été aménagée dans ledit corps pour permettre son mouvement longitudinal et dont la position d'extrême est délimitée par une butée (35); en prévoyant au moins à cette fin, que l'extrémité de l'arbre de transmission (26) du tambour récepteur (22) est creuse afin de permettre l'insertion de l'extrémité (36), de préférence conique, du corps tubulaire (37), ladite section creuse ayant des rainures (29) pour l'insertion des ailettes radiales (34); de manière que lors de la réalisation de l'accouplement du cadre amovible (19), le mouvement longitudinal des ailettes radiales ait lieu lors de la mise en contact du bord de l'arbre de transmission (26) du cadre amovible (19), de manière que lors de la rotation du moteur et lorsque les ailettes radiales (34) coïncident avec les rainures (29), leur insertion et leur embrayage automatique ont lieu.

10. Appareil d'impression par transfert de chaleur, selon la revendication 6, **caractérisé en ce que** le dispositif ainsi que le cadre amovible (19) ont des

moyens d'auto-centrage qui sont définis par une série de bras de centrage (20) disposés sur le cadre amovible (19) qui sont insérés dans une série de tubes de centrage (25) aménagés dans le dispositif.

11. Appareil d'impression par transfert de chaleur, selon la revendication précédente, **caractérisé en ce que** les moyens d'auto-centrage de la tête (4) sur la bande à imprimer (13), sont définis par un épaulement (16) aménagé dans la pièce mobile (7) qui est situé entre deux épaulements (17) disposés dans le support (10) de la tête (4), de manière que les trois épaulements (16 et 17) traversent un arbre (18) sur lequel le support (10) de la tête (4) bascule lors de la mise en contact avec la bande à imprimer (13), en réalisant l'auto-centrage.

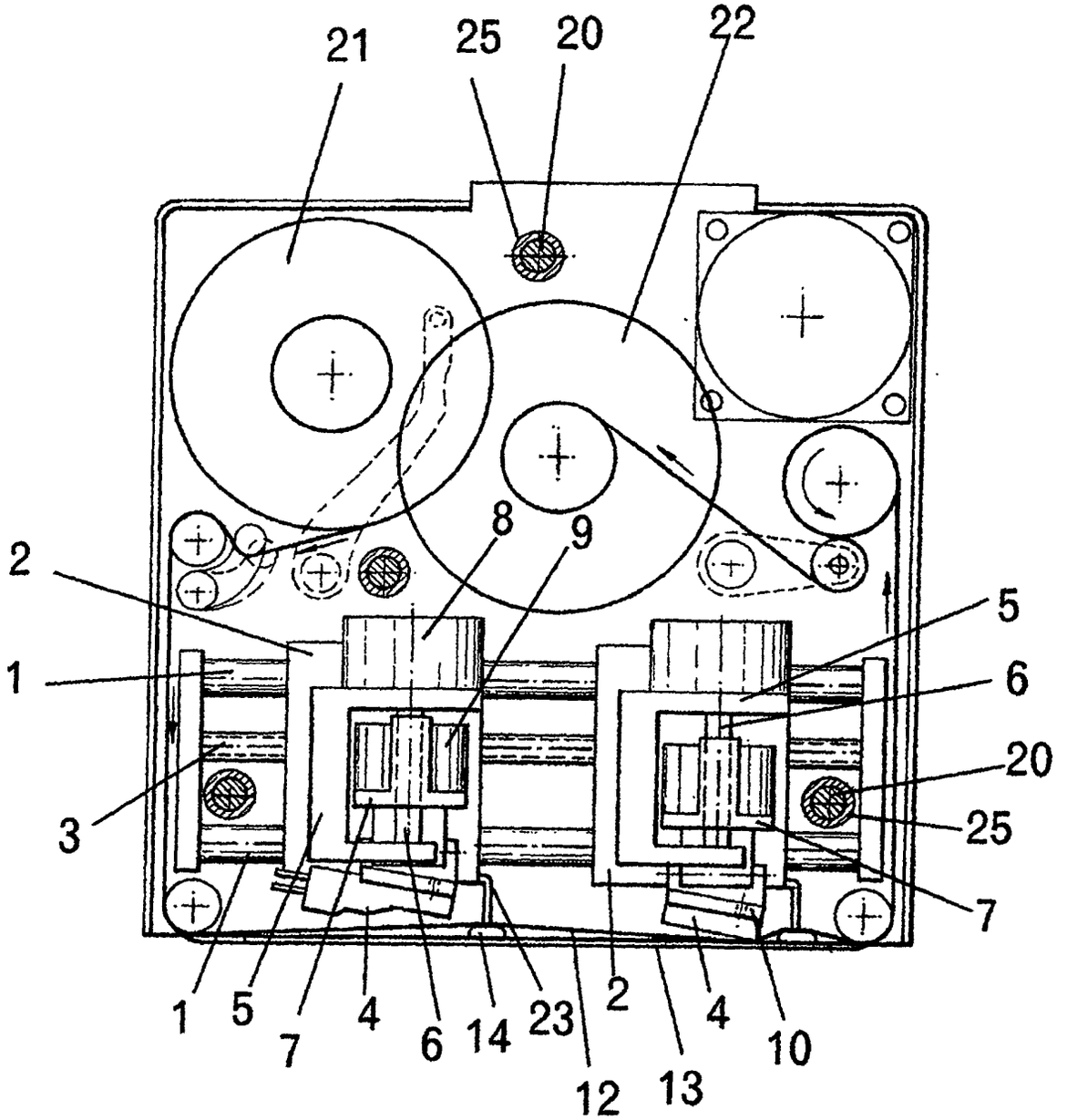


FIG. 1

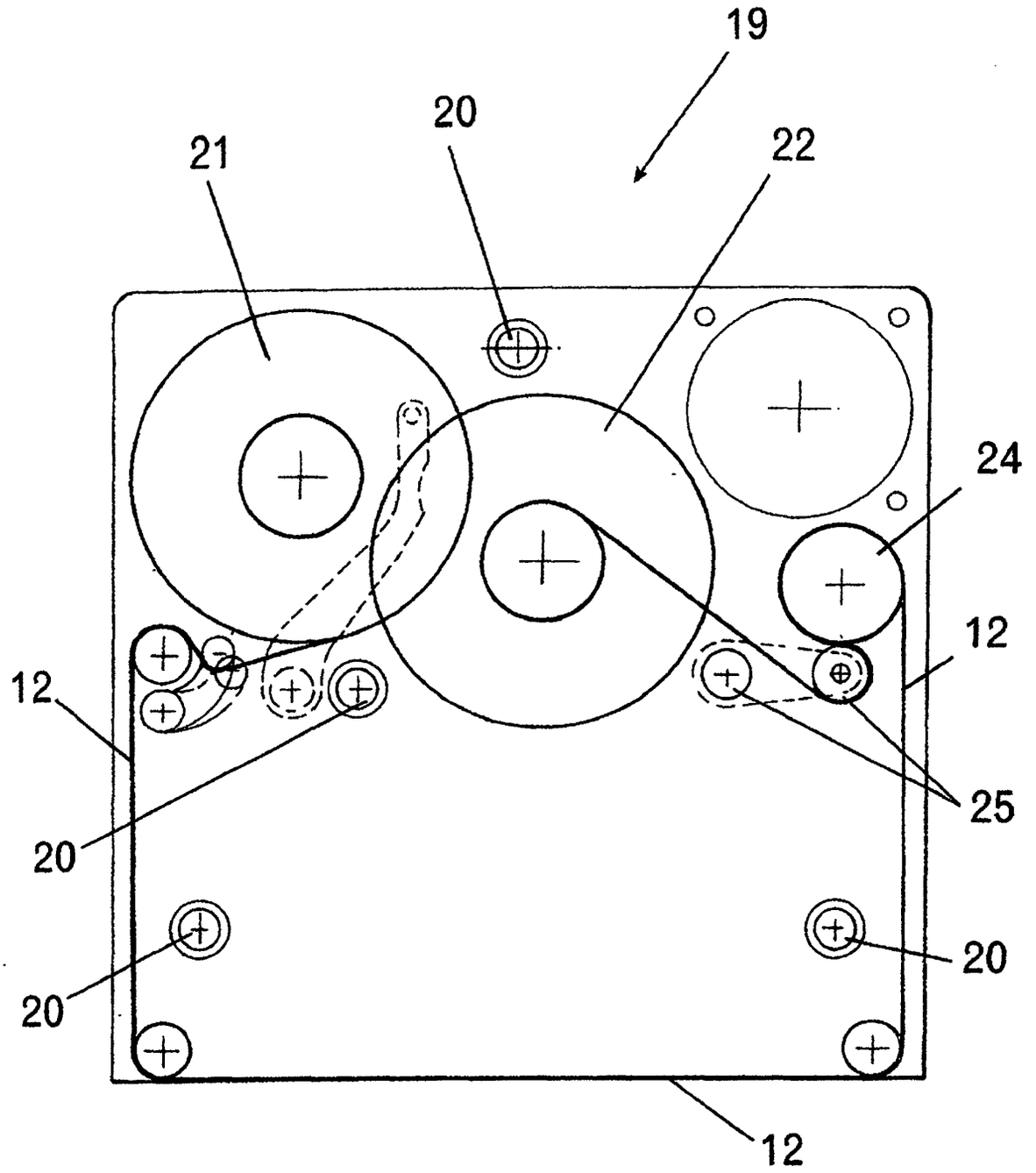


FIG. 2

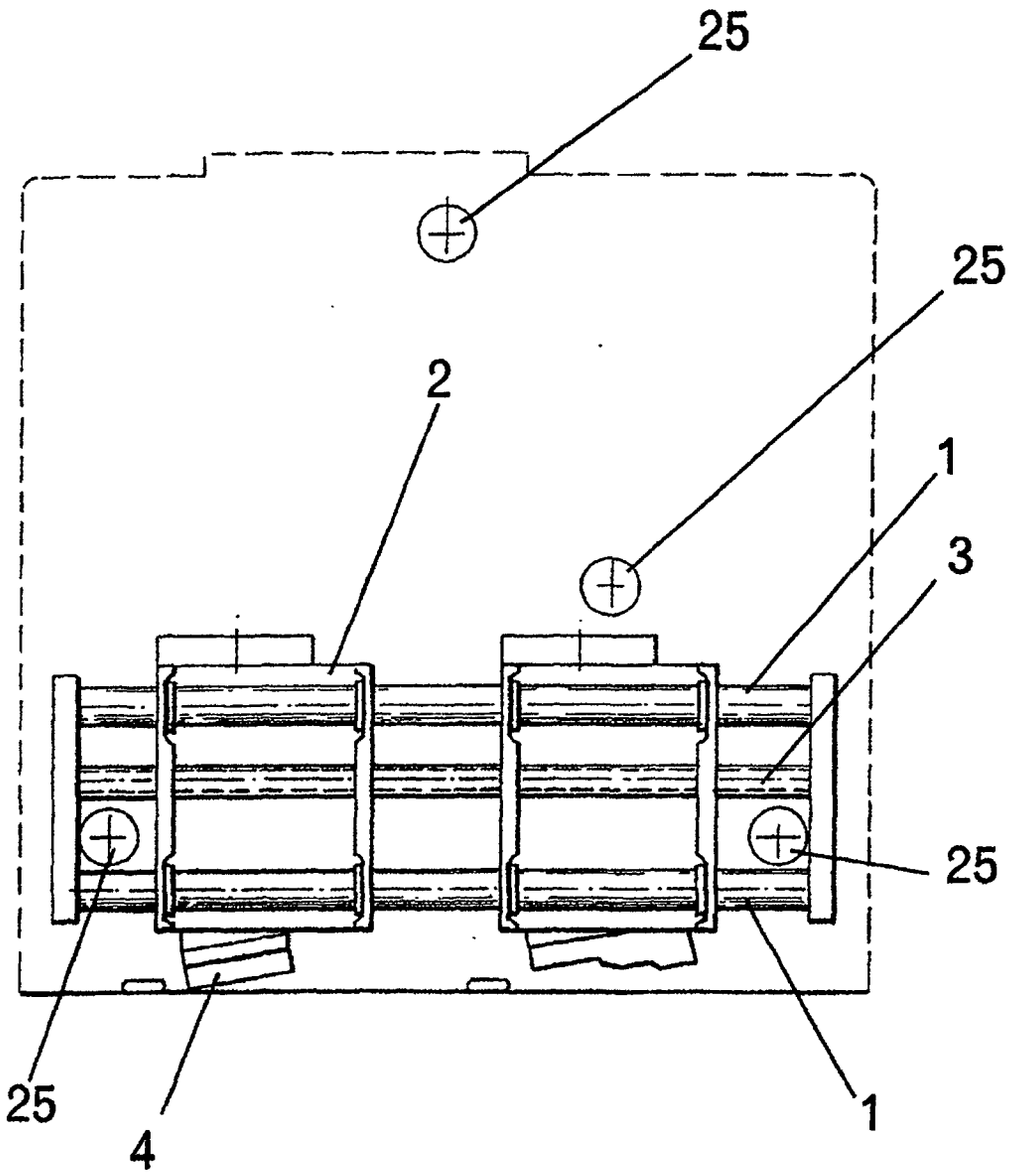


FIG. 3

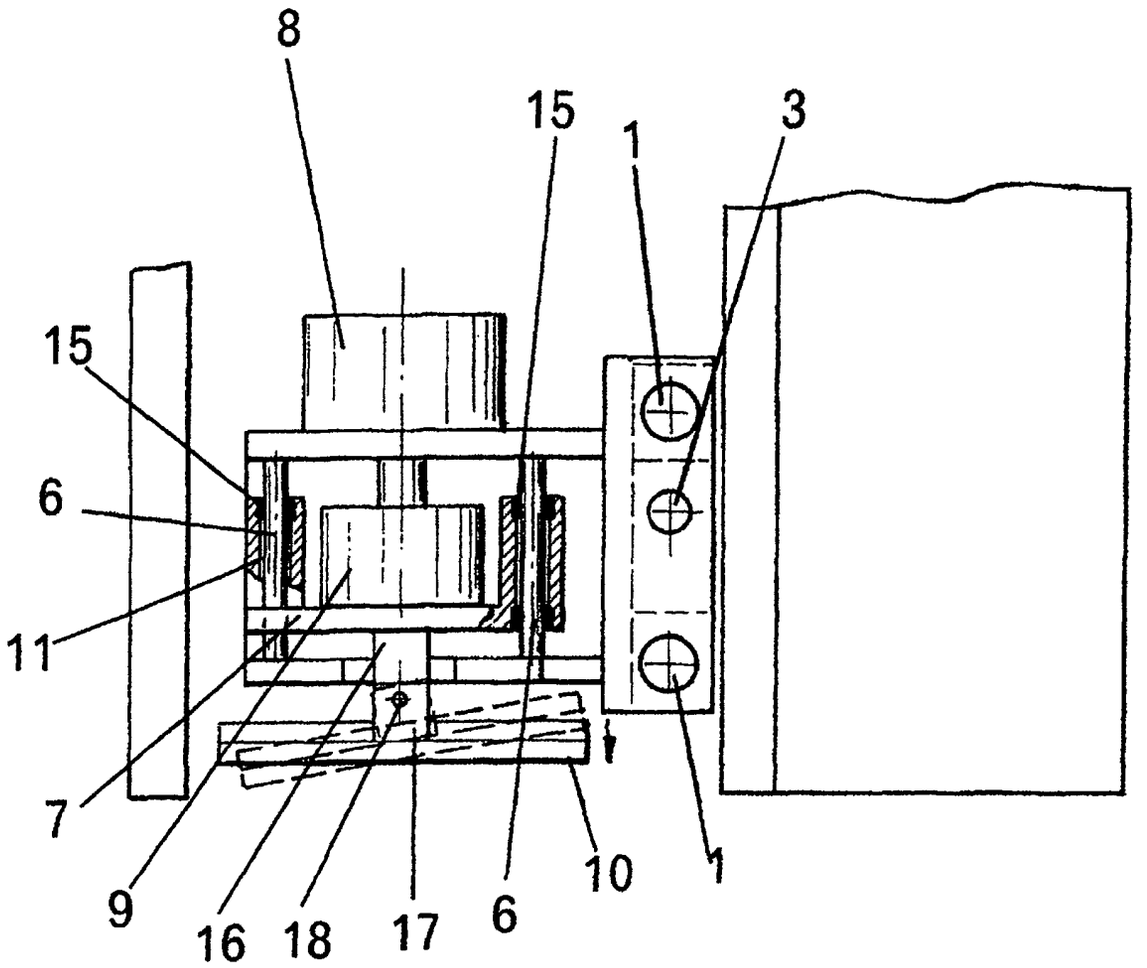


FIG. 4

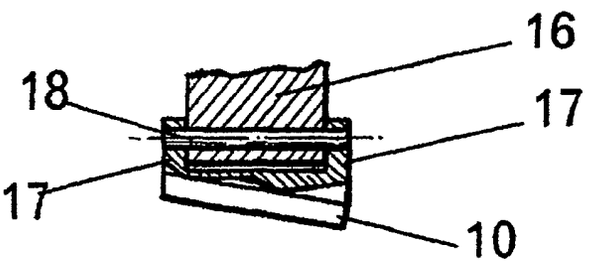


FIG. 5

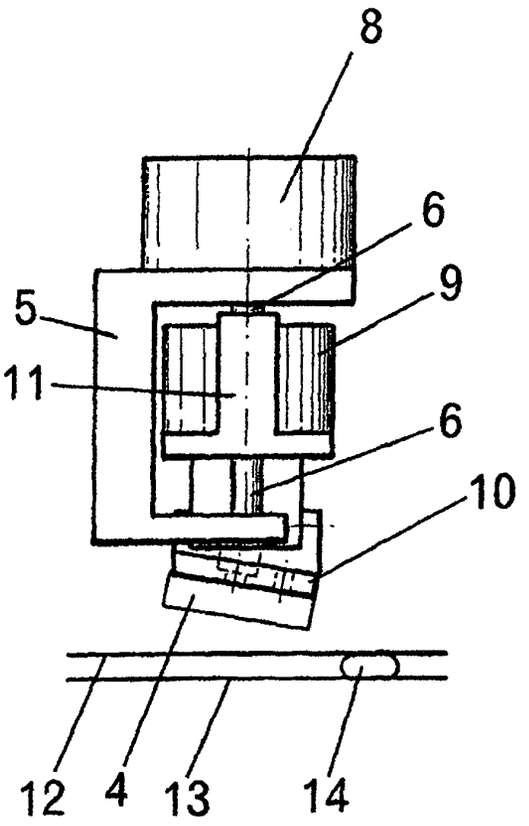


FIG. 6

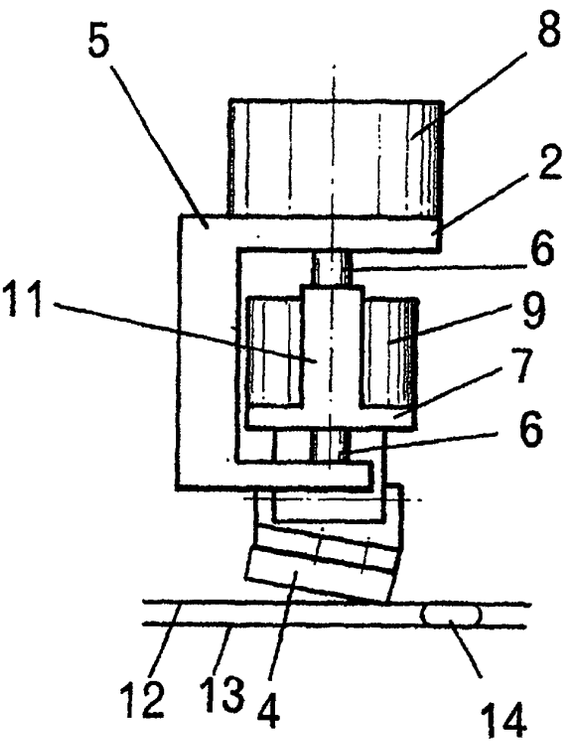


FIG. 7

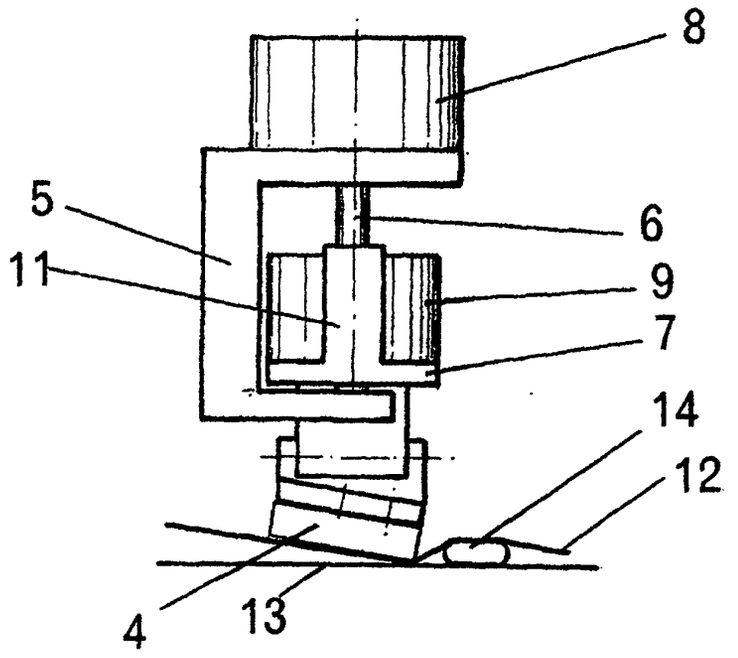


FIG. 8

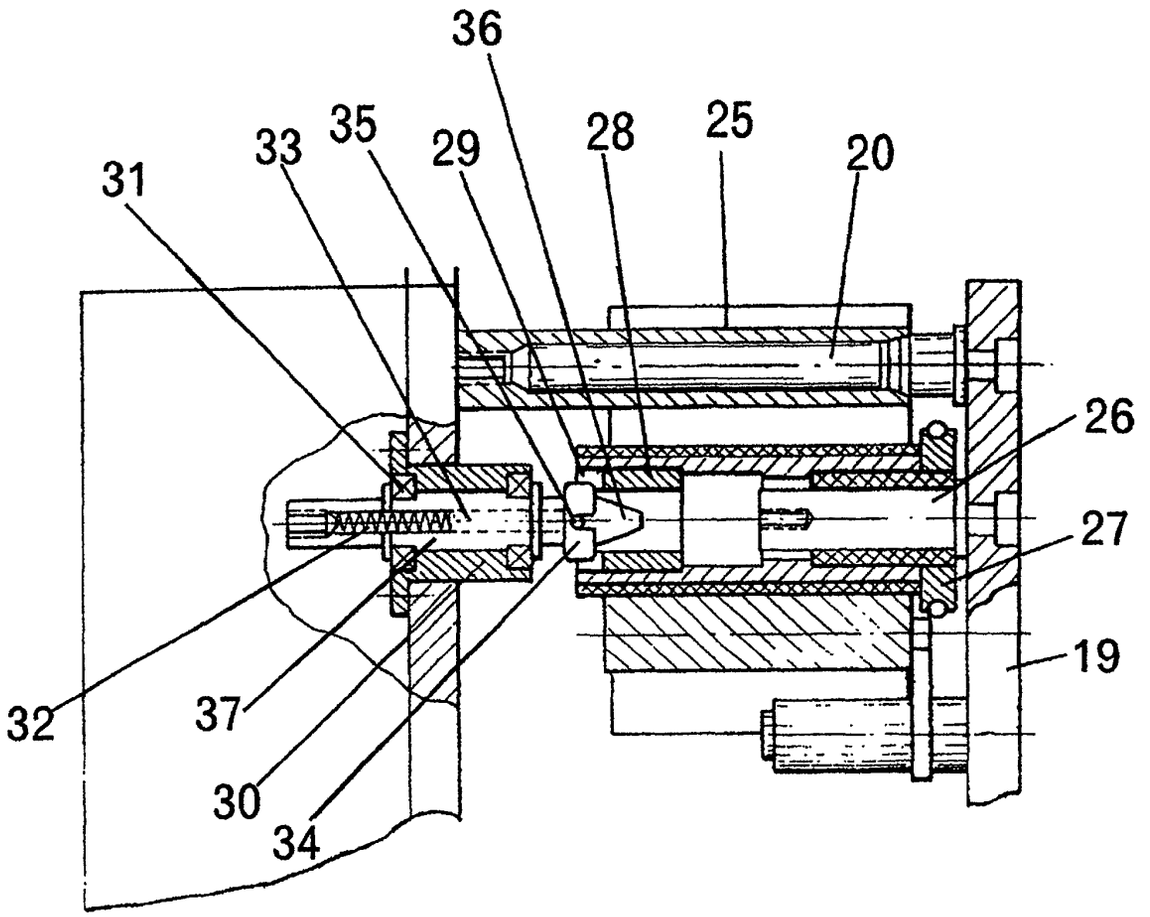


FIG. 9