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(54) MACHINE AND RIBBON SPOOL FOR THERMAL TRANSFER PRINTING

MASCHINE UND BANDSPULE FÜR THERMOTRANSFERDRUCK

MACHINE ET BOBINE DE RUBAN ENCREUR DESTINES A L'IMPRESSION PAR
THERMOTRANSFERT

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Description

[0001] The present invention relates in general to thermal transfer printing of images on items, such as boxes or packages for products.

[0002] In the present description the word "image" is used in its broad sense to mean a text, drawing, logo, bar code or any other two-dimensional graphical representation.

[0003] EP-A-0 609 107 discloses a spindle and ribbon spool arrangement for a printing machine comprising at least one rotating spindle, and at least one ribbon spool, to be mounted on the spindle and having an axial passage in which there are defined transversely re-entrant connecting formations. In this prior arrangement the spindle comprises an axial portion onto which the ribbon spool is to be mounted, and a plurality of transversely projecting elements able to engage in the connecting formations of the ribbon spool in such a way that the spindle and the spool can rotate together. The arrangement of the connecting formations of the spool and the projecting elements of the spindle are such that the ribbon spool is connectable to the spindle simply by inserting the spindle through a predetermined end of the axial passage of the ribbon spool.

[0004] An object of the present invention is to provide an improved spindle and ribbon spool arrangement for a thermal transfer printing machine.

[0005] This and other objects are achieved according to the invention with a spindle and ribbon spool arrangement whose main features are defined in the attached Claim 1.

[0006] Other aspects, features and advantages of the present invention will become clear in the course of the following detailed description, given purely by way of non-restrictive example, with reference to the appended drawings, in which:

Figure 1 is a partial view in front elevation of a thermal transfer printing machine including a spindle and ribbon/spool arrangement according to the present invention;

Figure 2 is a partial view on a larger scale, taken on the section plane marked II-II in Figure 1;

Figure 3 is a partially sectioned view of a spindle used in the machine according to Figure 1;

Figure 4 is a cross section view taken on the plane marked IV-IV in Figure 3;

Figure 5 is a perspective view of the spindle shown in Figures 2 and 3;

Figure 6 is a front view of a ribbon spool according to the present invention;

Figure 7 is a view in section taken on the plane marked VII-VII in Figure 6;

Figure 8 is a front view that shows a ribbon spool according to the present invention;

Figure 9 is a view in section on the plane marked IX-IX in Figure 8; and

Figure 10 shows an insert for a ribbon spool according to the invention.

[0007] In Figure 1, M is a general reference for a machine for the printing of images by thermal transfer.

[0008] In the embodiment illustrated by way of example, this machine comprises a supporting structure S in which rotatable spindles 1 and 2 carry reels 3 and 4, respectively, on which an auxiliary or receiving ribbon N and an inked ribbon R, respectively, are wound, for carrying out printing methods of the type described in the abovementioned European Patent.

[0009] The ribbons R and N are of essentially the same width and follow respective predetermined paths in the machine M.

[0010] In the embodiment illustrated by way of example, the ribbons N and R are brought together downstream of their respective winding reels 3 and 4 at a first turn roller R1 and then pass together between another turn roller R2 and a thermal dotline print head H, of a type known per se. Downstream of this print head the inked ribbon R is again deflected by a roller R3 and then continues towards a thermal transfer device (not shown) of a type known per se, for example of the heated transfer roller or pad type. On returning from the thermal transfer device, the ribbon R passes around turn rollers R4 and R5, and finally comes to a rewinding reel, marked 6 in Figure 1, mounted on a driven spindle 2'.

[0011] Downstream of the deflection roller R2 the auxiliary ribbon N runs on past another deflection roller R6 to a rewinding reel 5 mounted on a driven spindle 1'.

[0012] Advantageously, the spindles 1 and 2 that carry the reels 3 and 4 (and the rewinding spindles 1' and 2') are made as will now be described with reference to Figures 2 to 5, and correspondingly the reels 3 and 4 (and the reels 5 and 6) comprise respective ribbon spools 30 advantageously made as will be described with reference to Figures 2 and 6 to 10.

[0013] Referring particularly to Figures 2 and 3, a spindle 1 of this kind essentially comprises a shaft 10 mounted rotatably via a bearing 11 in a retaining element 12 fixed to the supporting structure S by means of screws 13.

[0014] The shaft 10 has a cylindrical portion 14 of enlarged diameter integral with an intermediate portion 15, also cylindrical, of the spindle. Two diametrically opposite longitudinal slots marked 16 and 17 are formed in the intermediate portion 15 of the spindle. These slots, which may advantageously have an essentially rectangular cross section, each receive a key element 18 and 19, respectively (see in particular Figures 2 to 4).

[0015] As can be seen more clearly for example in Figures 3 and 5, two circumferential and axially separate grooves 20 and 21 are formed in the intermediate portion 15 of the spindle 1. Elastic sealing rings 22, 23, respectively, are engaged in these grooves. These rings act elastically on the key members 18 and 19 to keep them in contact with the bottom walls of the slots 16 and 17 of the intermediate portion 15 of the spindle.

[0016] Away from the head 14, the intermediate portion 15 of the spindle meets a terminal axial portion 24 of the spindle, having a reduced diameter, a shoulder 25 being formed in the transition (see for example Figure 5).

[0017] The key members 18 and 19 have respective end portions 18a and 19a that extend along the axial portion 24 of the spindle 1, to which they present respective shaped profiles or inclined planes 18b and 19b.

[0018] The axial portion 24 of the spindle has an external thread 26 on which a tapped part 27 is screwed. Advantageously, but not necessarily, the free end 27a of the tapped part has a squashed, essentially plate-like configuration that can easily be gripped for screwing or unscrewing the said tapped part onto or off the threaded portion 26 of the spindle.

[0019] The opposite end 27b of the tapped part 27 advantageously has a conical outer surface (Figure 3).

[0020] When the tapped part 27 is screwed onto the threaded shank 24 of the spindle, the end 27b of the tapped part is able to engage against the inclined planes 18b and 19b of the key members 18 and 19. This essentially pushes the key members apart in a generally radial direction, towards the exterior, for reasons which will become clearer later.

[0021] With reference to Figures 2, 6 and 7, in the embodiment illustrated the reel 3 of auxiliary ribbon N comprises a ribbon spool which has the general reference 30.

[0022] This spool 30 has an essentially cylindrical tubular general form with an axial passage 31 running through it to accommodate the spindle 1.

[0023] In the embodiment illustrated the ribbon spool 30 comprises a cylindrical tubular core 32 of e.g. pressboard, on which the auxiliary ribbon N is rewound, and a cylindrical tubular insert 33 made of an essentially more rigid material, e.g. moulded plastic.

[0024] The insert 33 is shorter than the core 32 and is fixed inside the latter by for example driving it in axially with radial interference in such a way that its end 33a located furthest inside the core 32 defines an annular locating shoulder designed to meet the shoulder 25 of the spindle 1.

[0025] Advantageously, as seen in Figure 10, the insert 33 may be provided with a plurality of peripheral projections 34, such as ribs or fluting, for digging into the inside surface of the core 32 and improving the grip between the two.

[0026] Referring to Figures 6 and 7, in the inside surface of the insert 33, two diametrically opposite slots 35 and 36 are made.

[0027] Due to the presence of the insert 33, the axial passage 31 defined in the ribbon spool 30 effectively has a first portion 31a of larger diameter, and a second portion 31b of smaller diameter. These portions of the passage 31 meet at the shoulder 33a formed by the innermost end of the insert 33 (Figure 7).

[0028] Referring to Figure 2, the total length L of the ribbon spool 30, that is the length of the core 32, is such that when the spool is placed on the spindle 1 the tapped

part 27 partly protrudes from the spool.

[0029] The reel 3 of auxiliary ribbon N can be pushed onto the spindle 1 until the shoulder 33a of the spool meets the corresponding reference and stop shoulder 25 of the spindle 1. When connected, the end portions 18a, 19a of the key members 18 and 19 of the spindle extend along the slots 35 and 36, respectively, of the insert 33, forming a prismatic coupling between the spool 3 and the spindle 1. By turning the tapped part 27 it is thus possible to radially open the ends 18a and 19a of the key members 18 and 19 against the bottom walls of the slots 35 and 36 of the spool 30 for effective clamping, so that the spool 3 and the spindle 1 are held firmly together when rotated.

[0030] As will be clear from the above description, the shoulder 33a and the slots 35 and 36 of the ribbon spool are such that the spindle 1 can be connected to the reel 3 only by introducing this spindle through the large-diameter end 31a of the axial passage 31.

[0031] Referring to Figure 2, the length l of the insert 33 is equal to half the length L of the core 32. This feature ensures that the reel 3 is central when positioned on the spindle 1, relative to the shoulder 25, independently of the width L of the ribbon N used.

[0032] The axial passage 31 through the ribbon spool, with its change of cross section, ensures that the reel 3 cannot be mounted on the spindle the wrong way round. This feature is particularly helpful in a machine such as that shown in Figure 1, where the auxiliary ribbon N and the inked ribbon R are rewound in opposite directions on their respective ribbon spools, and are therefore intended to unwind in use in opposite directions (see Figure 1, and also compare Figures 6 and 7 relating to the reel 3 of auxiliary ribbon N with Figures 8 and 9 which relate instead to the reel 4 of inked ribbon R).

[0033] The solution described thus far is particularly advantageous as it makes it possible to use reels of auxiliary ribbon N or inked ribbon R of standard type, usually produced on a tubular cylindrical core, of e.g. pressboard, with a constant diameter of its internal passage. In this case it is advantageously possible to insert a respective insert, such as the insert 33 described earlier, into the cores of these reels.

[0034] Advantageously, the inserts 33 of the reels 3 and 4 of auxiliary ribbon N and inked ribbon R, respectively, have a visible feature, such as colour, which they share with the corresponding spindle 1 or 2 (or at least part thereof, such as the tapped part 27), this characteristic being different for the two spindles 1 and 2 and for the cores 33 of the respective ribbon spools. For example, cores 33 of spools carrying the auxiliary ribbon N and the tapped part 27 of the corresponding spindle 1 may be red, while cores 33 and spools carrying the inked ribbon R and the tapped part 27 of the corresponding spindle 2 may be black.

[0035] In an alternative embodiment (not shown) the ribbon spools for the reels of auxiliary ribbon and inked ribbon may be made in one piece, e.g. a single plastic

moulding, with an overall shape corresponding to the unit formed by the core 32 and insert 33 of the spools 30 described above.

[0036] The above description also applies to the spindles 1' and 2' and the associated ribbon rewinding spools. When in use, the spools 30 of the reels of ribbon 3 and 4, once fully unwound, can be removed from the spindles 1 and 2 and mounted on the spindles 1' and 2' (the reels of rewound ribbon having first been removed), allowing them to be used as rewinding spools in the next operation.

[0037] Clearly, without departing from the principle of the invention, the embodiments and the construction details may differ greatly from those described and illustrated purely by way of non-restrictive example, without their departing from the scope of the invention, as defined in the accompanying claims.

Claims

1. A spindle and spool arrangement for a thermal transfer printing machine (M) comprising
 - at least one rotating spindle (1, 2; 1', 2'), and
 - at least one ribbon spool (30) mounted on the said spindle (1, 2; 1', 2') and having an axial passage (31) in which a transversely projecting locating formation (33a) is defined, and at least one transversely re-entrant connecting formation (35, 36);
 - the spindle (1, 2; 1', 2') comprising
 - an axial portion (15) on which a ribbon spool (30) is designed to be mounted; the said axial portion (15) of the spindle having a stop shoulder (25) against which the locating formation (33a) of the ribbon spool (30) is designed to abut; and
 - at least one transversely projecting element (18a, 19a) able to engage in the connecting formation (35, 36) of the ribbon spool (30) in such a way that the spindle and the spool (30) rotate together;
 - the arrangement of the locating (33a) and connecting (35, 36) formations of the spool (30), and of the stop shoulder (25) and of the projecting element (18a, 19a) of the spindle being such that the ribbon spool (30) is connectable to the spindle simply by inserting the spindle through a predetermined end (31a) of the axial passage (31) of the ribbon spool (30).
2. An arrangement according to Claim 1, in which the spindle (1, 2; 1', 2') is provided with tightening means (26, 27) capable of causing a radial movement of the abovementioned transversely projecting element (18a, 19a) towards the corresponding connecting formation (35, 36) on the ribbon spool (30) mounted on the spindle; the said tightening means comprising an actuating member (27) projecting beyond the ribbon spool (30) connected to the spindle.
3. An arrangement according to Claim 2, in which the spindle (1, 2; 1', 2') has a first and a second axial portions (15, 24) having a larger cross section and a smaller cross-section, respectively, between which the abovementioned stop shoulder (25) is defined; at least one longitudinal slot (16, 17) being produced in the first axial portion (15), to take a radially movable key member (18, 19), one end (18a, 19a) of which extends along the said second axial portion (24) of the spindle and has a shaped profile, in particular an inclined plane (18b, 19b); and in which the said second axial portion (24) of the spindle has a thread (26) on which a tapped part (27) is screwed, a first end (27a) of which projects out of the ribbon spool (30) connected to the spindle, and the second end (27b) of which is able to interact with the said shaped profile (18b, 19b) of the key member (18, 19) in such a way as to bring about a movement of this key member (18, 19) towards the corresponding connecting formation (35, 36) on the ribbon spool (30).
4. An arrangement according to Claim 3, in which the said first axial portion (15) of the spindle has at least one peripheral groove (20, 21) containing an elastic sealing ring (22, 23) capable of keeping the said key member or members (18, 19) in the corresponding slot or seat (16, 17).
5. An arrangement according to one of the preceding claims, wherein the ribbon spool (30) comprises an essentially cylindrical tubular supporting element (32, 33), through which an internal axial passage (31) runs to accommodate the spindle, a variation of cross section being produced in an axially intermediate portion of the said passage (31) to define a transverse locating formation (33a), against which a reference and stop shoulder (25) on the spindle is designed to abut; at least one connecting formation (35, 36) being produced in an axial portion (31b) of the said passage (31) and able to connect prismatically with a portion (18a, 19a) of the spindle, in such a way that they rotate together; the connecting formation (35, 36) and the locating formation (33a) being produced in such a way that the said supporting element (32, 33) is connectable to the spindle purely by inserting the spindle through a predetermined end (31a) of the said axial passage (31).
6. An arrangement according to Claim 5, **characterized in that** it is a monolithic element, that is it is made in one piece.
7. An arrangement according to Claim 5, in which the said supporting element (32, 33) comprises a cylindrical tubular core (32), on the periphery of which a ribbon (N; R) is to be wound, and

an insert (33) of essentially cylindrical tubular shape, which is shorter than the core (32) and is fixed inside the said core (32) in such a way that one of its ends defines the abovementioned locating formation (33a);
the said connecting formation or formations (35, 36) being formed in the inside surface (31b) of the insert (33).

8. An arrangement according to Claim 7, in which the said cylindrical tubular core (32) is made of board or the like, and the insert (33) is of a comparatively more rigid material, in particular a plastic material, and is driven with interference into the said core (32).
9. An arrangement according to Claim 8, in which the insert (33) has at least a plurality of peripheral projections (34), such as ribs or fluting, for digging into the core (32).
10. An arrangement according to any one of Claims 7 to 9, particularly for a printing machine (M) having at least two rotating spindles (1, 2; 1', 2') designed to take corresponding spools (30) of identical shape for corresponding ribbons (N, R) of equal width (L) and which in operation are unwound or wound in opposite directions; the said insert (33) being positioned axially in the core (32) in such a way that the end of the insert (33) which defines the abovementioned locating formation (33a) is at the central axial section of the core (32).
11. An arrangement according to Claim 10, in which the insert (33) has a length. (l) equal to half the length (L) of the core (32).
12. An arrangement according to Claim 10 or 11, wherein the ribbon spool (30) has a visible feature, such as colour, which it shares with the spindle to which it must be connected in operation; the said feature being different for the two spindles and for the corresponding ribbon spools (30).
13. An arrangement according to any one of Claims 5 to 13, in which the said connecting formation or formations is or are a slot (35, 36) formed in the inside surface of a smaller-diameter axial portion (31b) of the abovementioned passage (31).
14. An arrangement according to Claim 13, in which there are formed in the smaller-diameter axial portion (31b) of the abovementioned passage (31) two preferably diametrically opposite slots (35, 36) designed to be engaged by respective radial projections (18a, 19a) of the spindle.

Patentansprüche

1. Spindel- und Spulenanordnung für eine Thermo-
transferdruckmaschine (M), wobei die Anordnung
aufweist:

mindestens eine Drehspindel (1, 2, 1', 2') und
mindestens eine auf der Spindel (1, 2, 1', 2')
angebrachte Bandspule (30), die einen Axialka-
nal (31), in dem eine transversal angeordnete
Positionierungsstruktur (33a) definiert ist, und
mindestens eine transversale Verbindungs-
struktur (35, 36) aufweist;
wobei die Spindel (1, 2, 1', 2') aufweist:

einen Axialabschnitt (15), auf dem eine
Bandspule (30) angeordnet werden kann;
wobei der Axialabschnitt (15) der Spindel
einen Anschlagbund (25) aufweist, an den
die Positionierungsstruktur (33a) der
Bandspule (30) anstoßen und/oder angren-
zen kann; und
mindestens ein transversal angeordnetes
Element (18a, 19a), das mit der Verbin-
dungsstruktur (35, 36) der Bandspule (30)
so in Eingriff kommen kann, dass die Spin-
del und die Spule (30) zusammen rotieren;
wobei die Anordnung der Positionierungs-
(33a) und der ein oder mehreren Verbin-
dungsstrukturen (35, 36) der Spule (30) und
des Anschlagbunds (25) sowie des trans-
versal angeordneten Elements (18a, 19a)
der Spindel so ist, dass die Bandspule (30)
einfach durch Einsetzen der Spindel durch
ein vorgegebenes Ende (31a) des Axialka-
nals (31) der Bandspule (30) mit der Spindel
verbindbar ist.

2. Anordnung nach Anspruch 1, wobei die Spindel (1, 2, 1', 2') mit mindestens einer Befestigungseinrichtung (26, 27) ausgestattet ist, die eine Radialbewegung des oben erwähnten transversal angeordneten Elements (18a, 19a) zu der entsprechenden Verbindungsstruktur (35, 36) an der auf der Spindel montierten Bandspule (30) bewirken kann; wobei die Befestigungseinrichtung ein Betätigungselement (27) aufweist, das über die mit der Spindel verbundene Bandspule (30) vorsteht.

3. Anordnung nach Anspruch 2, wobei die Spindel (1, 2, 1', 2') erste und zweite Axialabschnitte (15, 24) mit einem größeren Querschnitt bzw. einem kleineren Querschnitt aufweist, zwischen denen der oben erwähnte Anschlagbund (25) definiert ist; wobei in dem ersten Axialabschnitt (15) mindestens ein Längsschlitz (16, 17) erzeugt wird, um ein radial verschiebbares Element (18, 19) aufzunehmen, dessen eines Ende (18a, 19a) sich entlang dem zweiten Axi-

- alabschnitt (24) der Spindel erstreckt und ein Formprofil, insbesondere eine schiefe Ebene (18b, 19b), aufweist;
und wobei der zweite Axialabschnitt (24) der Spindel ein Gewinde (26) aufweist, auf das ein Teil mit Gewinde (27) aufgeschraubt wird, dessen erstes Ende (27a) aus der mit der Spindel verbundenen Bandspule (30) vorsteht, während sein zweites Ende (27b) mit dem Formprofil (18b, 19b) des radial verschiebbaren Elements (18, 19) so wechselwirken kann, dass es eine Verschiebung dieses Elements (18, 19) zu der entsprechenden Verbindungsstruktur (35, 36) an der Bandspule (30) bewirkt.
4. Anordnung nach Anspruch 3, wobei der erste Axialabschnitt (15) der Spindel mindestens eine Umfangsrille (20, 21) aufweist, die einen elastischen Dichtungsring (22, 23) enthält, der das eine oder die mehreren radial verschiebbaren Elemente (18, 19) in dem entsprechenden Schlitz oder Sitz (16, 17) halten kann.
5. Anordnung nach einem der vorstehenden Ansprüche, wobei die Bandspule (30) aufweist:
- ein im Wesentlichen zylinderröhrenförmiges Trägerelement (32, 33), durch das ein innerer Axialkanal (31) hindurchgeht, um die Spindel aufzunehmen; wobei in einem axialen Mittelabschnitt des Kanals (31) eine Querschnittsänderung erzeugt wird, um eine transversale Positionierungsstruktur (33a) zu definieren, an die ein Bezugs- und Anschlagbund (25) an der Spindel anstoßen kann;
mindestens eine Verbindungsstruktur (35, 36), die in einem Axialabschnitt (31b) des Axialkanals (31) erzeugt wird und sich prismatisch mit einem Abschnitt (18a, 19a) der Spindel so verbinden kann, dass beide zusammen rotieren; wobei die Verbindungsstruktur (35, 36) und die Positionierungsstruktur (33a) so erzeugt werden, dass das Trägerelement (32, 33) durch bloßes Einsetzen der Spindel durch ein vorgegebenes Ende (31a) des Axialkanals (31) mit der Spindel verbunden werden kann.
6. Anordnung nach Anspruch 5, **dadurch gekennzeichnet, dass** sie ein monolithisches Element ist, d. h. in einem Stück gefertigt ist.
7. Anordnung nach Anspruch 5, wobei das Trägerelement (32, 33) aufweist:
- einen zylinderröhrenförmigen Kern (32), auf dessen Umfang ein Band (N,R) gewickelt werden soll, und
einen im Wesentlichen zylinderröhrenförmigen Einsatz (33), der kürzer ist als der Kern (32) und innerhalb des Kerns (32) so befestigt wird, dass eines seiner Enden die oben erwähnte Positionierungsstruktur (33a) definiert;
wobei die eine oder die mehreren Verbindungsstrukturen (35, 36) an der Innenfläche (31b) des Einsatzes (33) ausgebildet sind.
8. Anordnung nach Anspruch 7, wobei der zylinderröhrenförmige Kern (32) aus Pappe, Karton und/oder Holz oder dergleichen hergestellt ist und der Einsatz (33) aus einem vergleichsweise steiferen Material hergestellt ist, insbesondere einem Kunststoffmaterial, und im Presssitz in den Kern (32) eingepresst wird.
9. Anordnung nach Anspruch 8, wobei der Einsatz (33) zumindest eine Vielzahl von Umfangsvorsprüngen (34), wie z. B. Rippen oder eine Riffelung, aufweist, um sich in den Kern (32) einzugraben.
10. Anordnung nach einem der Ansprüche 7 bis 9, besonders für eine Druckmaschine (M) mit mindestens zwei Drehspindeln (1, 2, 1', 2'), die zur Aufnahme entsprechender Spulen (30) von identischer Form für entsprechende Bänder (N, R) von gleicher Breite (L) vorgesehen sind, die im Betrieb in entgegengesetzten Richtungen abgewickelt oder aufgewickelt werden; wobei der Einsatz (33) in dem Kern (32) axial so angeordnet ist, dass das Ende des Einsatzes (33), das die oben erwähnte Positionierungsstruktur (33a) definiert, im mittleren Achsenabschnitt des Kerns (32) liegt.
11. Anordnung nach Anspruch 10, wobei der Einsatz (33) eine Länge (l) hat, die gleich der halben Länge (L) des Kerns (32) ist.
12. Anordnung nach Anspruch 10 oder 11, wobei die Bandspule (30) ein sichtbares Merkmal aufweist, wie z. B. Farbe, das sie mit der Spindel gemeinsam hat, mit der sie im Betrieb verbunden werden muss; wobei das Merkmal für die zwei Spindeln und für die entsprechenden Bandspulen (30) unterschiedlich ist.
13. Anordnung nach einem der Ansprüche 5 bis 13, wobei die eine oder die mehreren Verbindungsstrukturen ein Schlitz (35, 36) ist bzw. sind, der in der Innenfläche eines Achsenabschnitts (31b) von kleinerem Durchmesser des oben erwähnten Kanals (31) ausgebildet ist.
14. Anordnung nach Anspruch 13, wobei in dem Achsenabschnitt (31b) von kleinerem Durchmesser des oben erwähnten Kanals (31) zwei vorzugsweise diametral gegenüberliegende Schlitz (35, 36) ausgebildet sind, die mit entsprechenden radialen Vorsprüngen (18a, 19a) der Spindel in Eingriff zu bringen

gen sind.

Revendications

1. Agencement de broche et bobine pour une machine d'impression par transfert thermique (M) comprenant au moins une broche rotative (1, 2 ; 1', 2'), et au moins une bobine à ruban (30) montée sur ladite broche (1, 2 ; 1', 2') et comportant un passage axial (31) dans lequel une formation de positionnement dépassant transversalement (33a) est définie, et au moins une formation de raccordement rentrant transversalement (35, 36) ; la broche (1, 2 ; 1', 2') comprenant une portion axiale (15) sur laquelle une bobine à ruban (30) est conçue pour être montée ; ladite portion axiale (15) de la broche comportant un épaulement d'arrêt (25) contre lequel la formation de positionnement (33a) de la bobine à ruban (30) est conçue pour buter ; et au moins un élément dépassant transversalement (18a, 19a) capable de se mettre en prise dans la formation de raccordement (35, 36) de la bobine à ruban (30) de telle manière que la broche et la bobine (30) tournent ensemble ; l'agencement des formations de positionnement (33a) et de raccordement (35, 36) de la bobine (30), et de l'épaulement d'arrêt (25) et de l'élément dépassant (18a, 19a) de la broche étant tel que la bobine à ruban (30) peut être raccordée à la broche simplement en insérant la broche dans une extrémité prédéterminée (31a) du passage axial (31) de la bobine à ruban (30).
2. Agencement selon la revendication 1, dans lequel la broche (1, 2 ; 1', 2') est pourvue d'un moyen de serrage (26, 27) capable de provoquer un mouvement radial de l'élément dépassant transversalement (18a, 19a) susmentionné vers la formation de raccordement (35, 36) correspondante sur la bobine à ruban (30) montée sur la broche, ledit moyen de serrage comprenant un organe d'actionnement (27) dépassant au-delà de la bobine à ruban (30) raccordée à la broche.
3. Agencement selon la revendication 2, dans lequel la broche (1, 2 ; 1', 2') comporte des première et seconde portions axiales (15, 24) ayant une plus grande section et une plus petite section, respectivement, entre lesquelles l'épaulement d'arrêt (25) susmentionné est défini ; au moins une fente longitudinale (16, 17) produite dans la première portion axiale (15) pour prendre un organe de clavette radialement mobile (18, 19), dont une extrémité (18a, 19a) s'étend le long de ladite seconde portion axiale (24) de la broche et a un profil mis en forme, en

particulier un plan incliné (18b, 19b) ; et dans lequel ladite seconde portion axiale (24) de la broche comporte un filetage (26) sur lequel une partie taraudée (27) est vissée, dont une première extrémité (27a) dépasse de la bobine à ruban (30) raccordée à la broche, et dont la seconde extrémité (27b) est capable d'interagir avec ledit profil mis en forme (18b, 19b) de l'organe de clavette (18, 19) de telle manière à occasionner un mouvement de cet organe de clavette (18, 19) vers la formation de raccordement (35, 36) correspondante sur la bobine à ruban (30).

4. Agencement selon la revendication 3, dans lequel ladite première portion axiale (15) de la broche comporte au moins une rainure périphérique (20, 21) contenant une bague d'étanchéité élastique (22, 23) capable de maintenir ledit organe ou lesdits organes de clavette (18, 19) dans la fente ou le siège (16, 17) correspondant.
5. Agencement selon l'une des revendications précédentes, dans lequel la bobine à ruban (30) comprend un élément de support tubulaire essentiellement cylindrique (32, 33), à travers lequel court un passage axial interne (31) pour loger la broche, une variation de section étant produite dans une portion axialement intermédiaire dudit passage (31) pour définir une formation de positionnement transversale (33a), contre laquelle un épaulement de référence et d'arrêt (25) sur la broche est conçu pour buter ; au moins une formation de raccordement (35, 36) étant produite dans une portion axiale (31b) dudit passage (31) et capable de se raccorder prismatiquement avec une portion (18a, 19a) de la broche, de telle manière qu'ils tourneront ensemble ; la formation de raccordement (35, 36) et la formation de positionnement (33a) étant produites de telle manière que ledit élément de support (32, 33) peut être raccordé à la broche simplement en insérant la broche dans une extrémité prédéterminée (31a) dudit passage axial (31).
6. Agencement selon la revendication 5, **caractérisé en ce qu'il** s'agit d'un élément monolithique, c'est-à-dire constitué d'un seul tenant.
7. Agencement selon la revendication 5, dans lequel ledit élément de support (32, 33) comprend un noyau tubulaire cylindrique (32), sur la périphérie duquel un ruban (N ; R) doit être enroulé, et un insert (33) de forme tubulaire essentiellement cylindrique, qui est plus court que le noyau (32) et est fixé à l'intérieur dudit noyau (32) de telle manière que l'une de ses extrémités définit la formation de positionnement (33a) susmentionnée ; ladite ou lesdites formations de raccordement (35, 36) étant formées dans la surface intérieure (31b)

de l'insert (33).

8. Agencement selon la revendication 7, dans lequel ledit noyau tubulaire cylindrique (32) est constitué de carton ou similaire, et l'insert (33) est constitué d'un matériau comparativement plus rigide, en particulier une matière plastique, et est entraîné avec interférence dans ledit noyau (32). 5
9. Agencement selon la revendication 8, dans lequel l'insert (33) comporte au moins une pluralité de saillies périphériques (34), telles que des nervures ou des cannelures, pour creuser dans le noyau (32). 10
10. Agencement selon l'une quelconque des revendications 7 à 9, en particulier pour une machine d'impression (M) comportant au moins deux broches rotatives (1, 2 ; 1', 2') conçues pour prendre des bobines (30) correspondantes de forme identique pour des rubans (N, R) correspondants de largeur égale (L) et qui, en fonctionnement, sont déroulées ou enroulées dans des sens opposés ; ledit insert (33) étant positionné axialement dans le noyau (32) de telle manière que l'extrémité de l'insert (33) qui définit la formation de positionnement (33a) susmentionnée se trouve au niveau de la section axiale centrale du noyau (32). 15
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11. Agencement selon la revendication 10, dans lequel l'insert (33) a une longueur (l) égale à la moitié de la longueur (L) du noyau (32). 30
12. Agencement selon la revendication 10 ou 11, dans lequel la bobine à ruban (30) a une particularité visible, telle qu'une couleur, qu'elle partage avec la broche à laquelle elle doit être raccordée en fonctionnement ; ladite particularité étant différente pour les deux broches et pour les bobines à ruban (30) correspondantes. 35
40
13. Agencement selon l'une quelconque des revendications 5 à 12, dans lequel ladite formation ou lesdites formations de raccordement est ou sont une fente (35, 36) formée dans la surface intérieure d'une portion axiale (31b) de plus petit diamètre du passage (31) susmentionné. 45
14. Agencement selon la revendication 13, dans lequel sont formées dans la portion axiale (31b) de plus petit diamètre du passage (31) susmentionné deux fentes de préférence diamétralement opposées (35, 36) conçues pour être mises en prise par des saillies radiales (18a, 19a) respectives de la broche. 50
55

FIG. 1

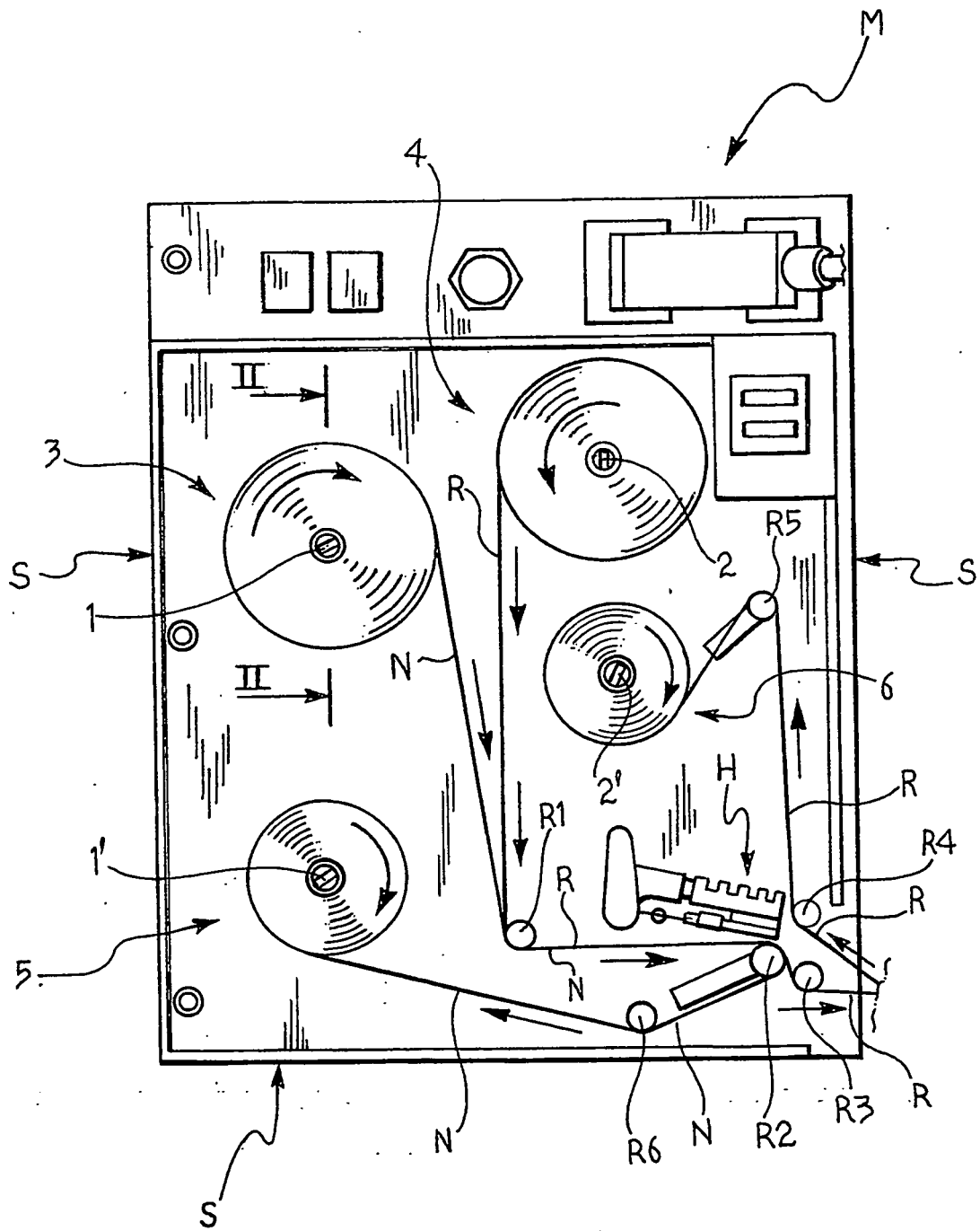
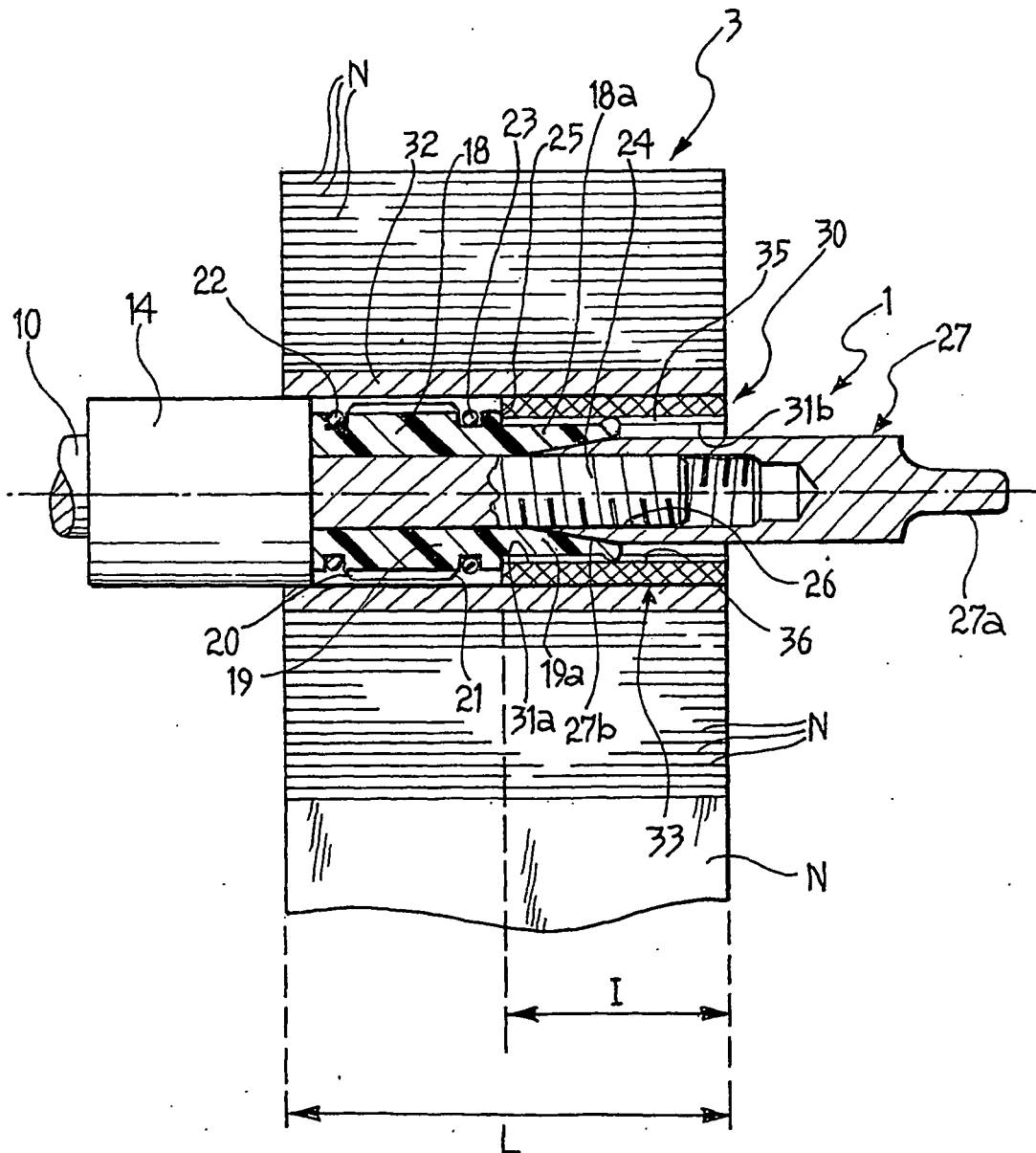
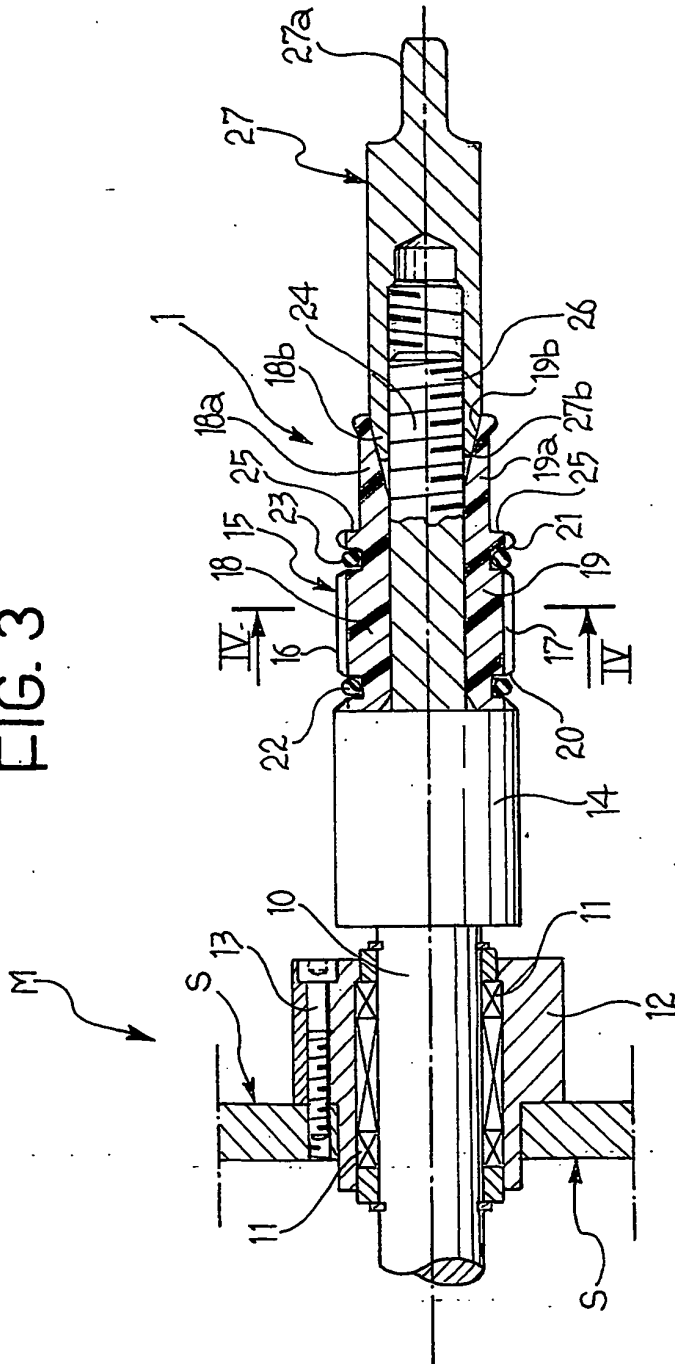


FIG. 2



364



4
G
L

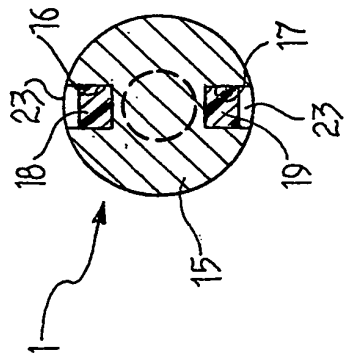


FIG. 5

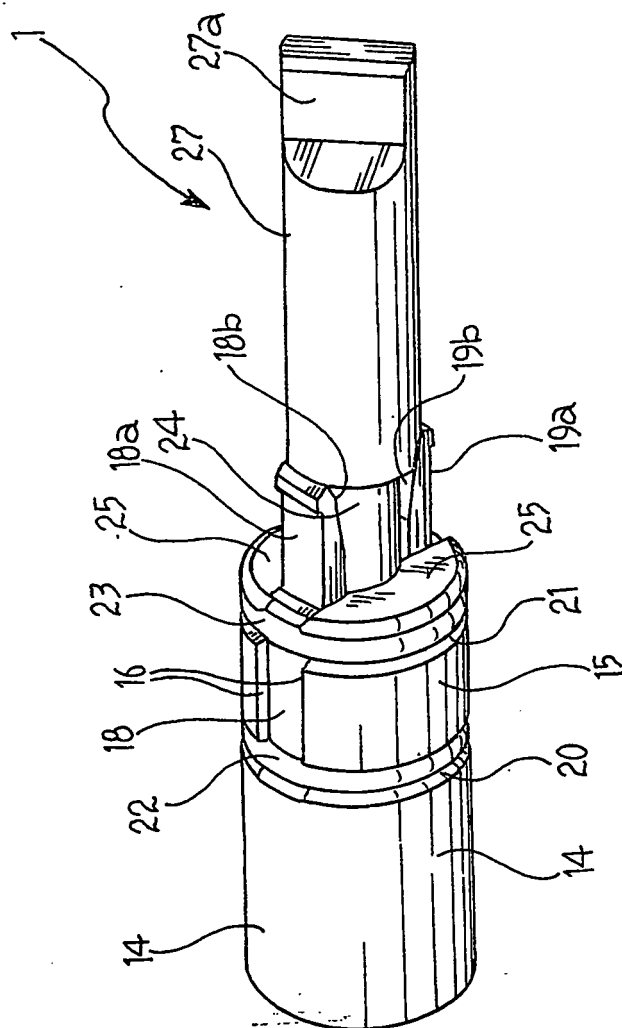


FIG. 6

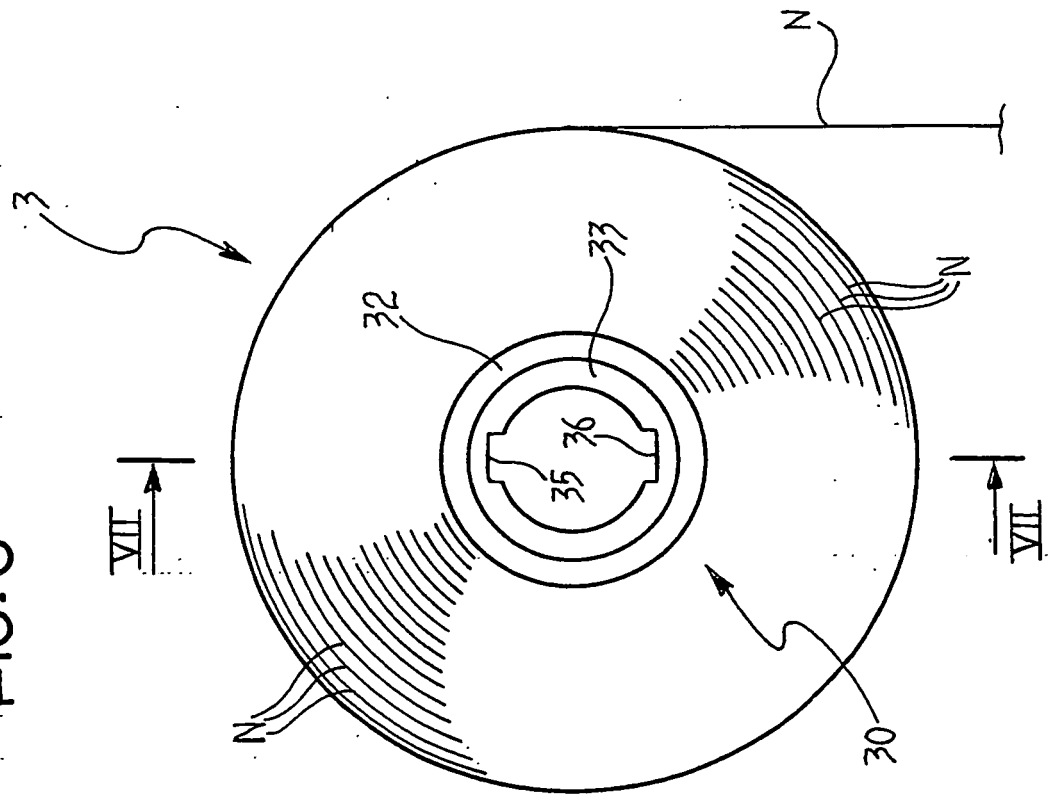
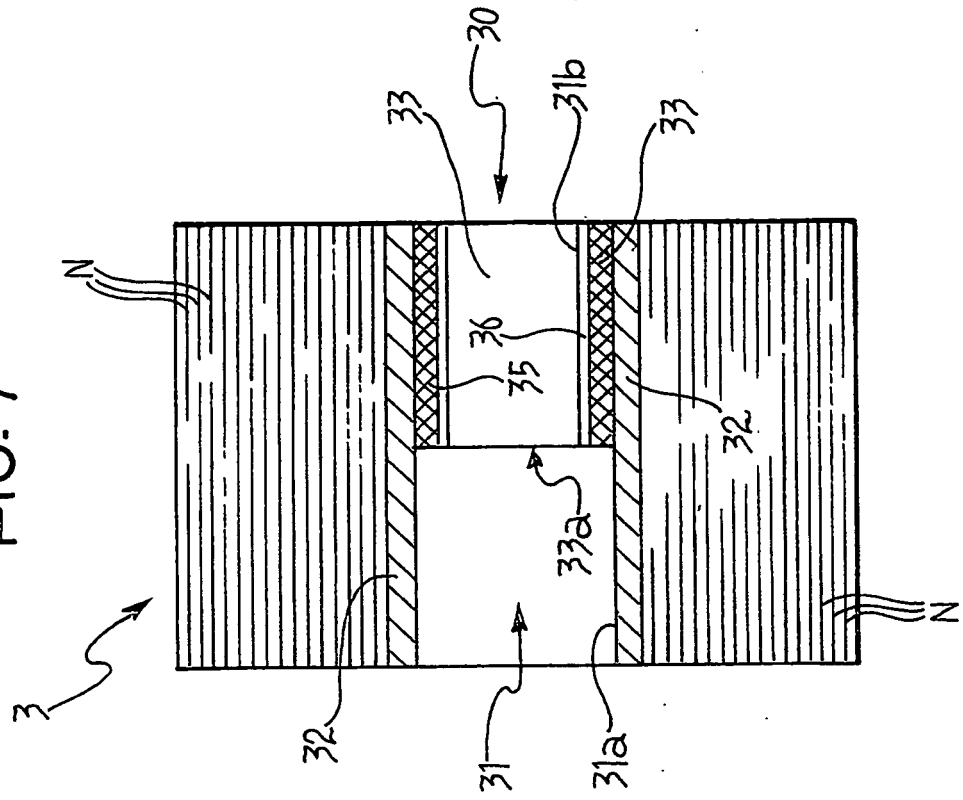
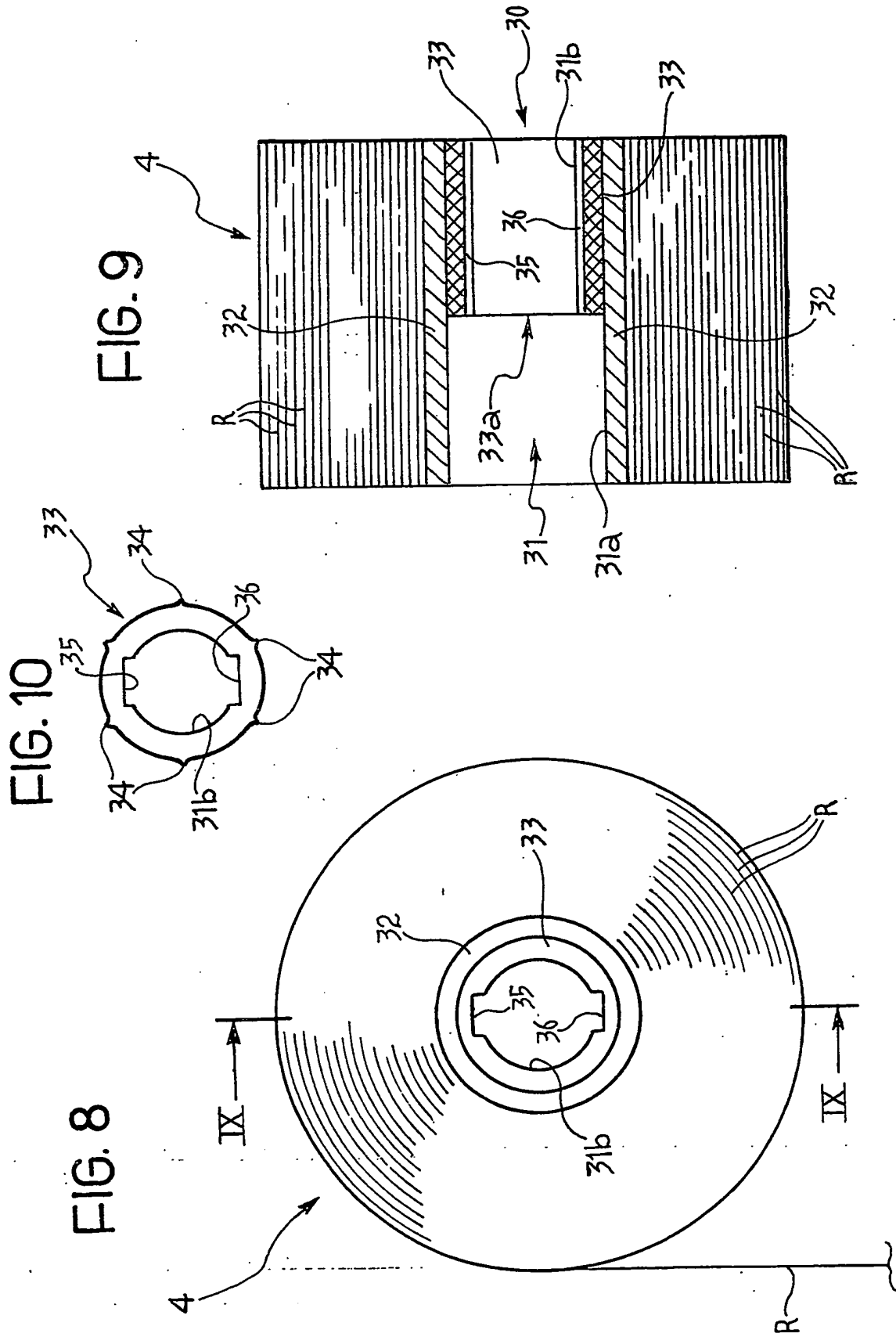


FIG. 7





REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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