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(54) **SPRING MATTRESSES**

FEDERMATRATZE

MATELAS À RESSORT

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Description

BACKGROUND OF THE INVENTION

[0001] The invention relates to the technical field concerning the production of spring mattresses obtained from the plurality of spring tubes.

DESCRIPTION OF THE PRIOR ART

[0002] According to a widely used constructive technology, the springs use to manufacture spring mattresses are enclosed in a plastic tube, which keep them firmly side by side at a prefixed reciprocal distance. This is obtained by welding the facing parts of the tube walls comprised between adjacent springs to each other, for example by ultrasonic welding, so that each spring is contained in a portion of tube, closed and separated from the adjacent portions.

[0003] Afterwards, the tube with the springs is cut into pieces to form spring packs having a selected length, and the spring packs are joined, side by side, so as to obtain an assembly formed by longitudinal and transversal rows of springs.

[0004] The joint between one spring pack and another is obtained, e.g. by a plurality of glue-spots, applied centered with respect to the spring height, in the touching areas between one spring pack and another.

[0005] The assembly of spring packs has length and width corresponding to the dimensions of the mattress to be manufactured.

[0006] Then, the assembly of spring packs is wrapped into the usual coverings, which form the mattress facings and sides.

[0007] The disadvantage of the mattress obtained according to the above mentioned constructive technique derives from the fact that the assembly of springs does not resist elastically in homogeneous way, because the elastic reaction depends on whether the weight is applied prevailingly extending longitudinally or transversally:

> In particular, it is observed that the spring deformation diminishes when the weight is loaded more on the rows of springs arranged along the spring packs extension rather than on transverse rows formed by springs of different adjacent spring packs.

[0008] The reason lies in the different load conditions which the springs of the rows along the spring pack extension, for example the ones disposed longitudinal along the mattress, must bear with respect to the springs of rows perpendicular to the mattress.

[0009] It appears that, for example, if a single spring is compressed, the adjacent springs belonging to the same spring pack will be also partially compressed by the tube.

[0010] Due to the compression of the first spring, the tube distributes part of the load to the adjacent springs, while no load is transferred to the springs adjacent in transversal direction, since they belong to different spring packs, joined to each other, as already said, only in the central area,

[0011] Because of these differences of the load distribution, a different softness of the mattress results with the same load, depending on whether the load Is distributed in a longitudinal or transversal way. In practice, considering that a mattress is aimed at receiving a human body, the above mentioned softness asymmetry depends on the way in which the body lies on the mattress, thus affecting the comfort condition.

[0012] Document WO 2005/102115, which comprises the features of the preamble of claim 1, discloses a spring mattress comprising a plurality of strings interconnected side by side, each string comprising a plurality of continuous casings and, enclosed therein, coil springs. Moreover, between at least some of the springs in at least one of the strings a slot is arranged which opens towards the upper or lower side of the mattress. According to an embodiment, the springs between which the slot is arranged are separated with an intermediate separation distance, which separation distance exceeds about 10% of the diameter of the largest turn of the adjoining springs.

SUMMARY OF THE INVENTION

[0013] The object of the present invention is to propose a spring mattress shaped in such a way, as to avoid the above mentioned disadvantage, thus obtaining a homogeneous reaction of the springs independently from the load orientation and distribution.

[0014] It is therefore specific object of the invention a spring mattress, including a plurality of spring tubes joined side by side, each spring tube comprising a continuous tube and a plurality of springs, enclosed into the tube and arranged side by side, at a selected distance, with facing parts of the tube walls between one spring and a subsequent one, joined by welding lines made parallel to the axes of the springs, so that each spring is contained in a respective portion of said tube, closed and separated from the adjacent portions, wherein longitudinal cuts are made starting from at least one side of the spring tube and extending inwards along and into said welding lines, to form at least one tubular segment for each portion of said portions, said welding lines having a predetermined minimum width, sufficient to keep the relevant portions sealed after the cuts are made, said spring mattress being characterized in that said spring tubes are joined by a plurality of substantially vertically aligned glue spots, applied to each portion.

[0015] Always according to the invention, each cut of said cuts could be made in a central part of the relevant welding line.

[0016] Still according to the invention, said opposite cuts could extend inwards for a predetermined depths.

[0017] Furthermore according to the invention, two opposite cuts could be made for each welding line starting

from opposite sides of the spring tube and extending inwards.

[0018] Advantageously according to the invention, said opposite cuts could have equal length.

[0019] Always according to the invention, said springs have different elastic behavior, so as to define differentiated softness areas.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020] The characteristic features of the invention will be pointed out in the following description of a preferred embodiment of the proposed spring mattress, according to what is proposed by the claims and with the help of the enclosed drawings, in which:

- Figures 1a and 1b show partial, lateral views of the proposed spring tube in a first and a second embodiments respectively;
- Figure 2 is a partial, top view of a spring assembly obtained by a plurality of spring tubes of Figure 1;
- Figures 3a (according to the present invention) and 3b (not part of the present invention) show section views taken along the section lines III-III of Figure 2, with an exemplification stress acting on a single spring of the first and second embodiments respectively;
- Figure 4 (not part of the present invention) is a section view taken along the section line IV-IV of Figure 2, with the stress of a single spring being pointed out.

BEST MODES OF CARRYING OUT THE INVENTION

[0021] Referring to the above mentioned Figures, reference numeral 1 indicates the spring tube from which the spring mattresses proposed by the invention is obtained.

[0022] The spring tube 1, like the known ones, includes a tube 10 of floppy plastic material, within which the springs 2 are enclosed and kept arranged side by side, at a selected distance.

[0023] The parts of the tube wall between one spring 2 and the subsequent one, are joined by welding lines 12, crossing the whole tube side to side, obtained e.g. by ultrasound welding. The welding lines are parallel to the axes A of the springs 2, so that each spring is contained within a closed portion 13 of the tube 10, separated from adjacent portions 13 (Figure 1 a and 1b).

[0024] According to the invention, the welding lines 12 have a width L sufficient to assure the sealing of the portions 13 even after having done longitudinal cuts 120 along a center line of each portion 13.

[0025] According to a first preferred embodiment of the invention, better shown in figure 1a, the cuts 120 are made starting from one side only of the tube and extend inwards.

[0026] The continuity of the tube 10, between one portion 13 and another, is maintained by the central part 12A of the welding line 12, and the remainder of the welding line, extending from the central part up to the side of the tube opposite to the one having the cut.

[0027] The cuts 120 define in each portion 13 a tubular segment 130 which is separated from the tubular segment 130 of the adjacent portions 13. Each tubular separated segment 130 permits independent axial compression of the relevant spring 2, which do not interfere with the axial extension of the adjacent springs of the same spring tube 1.

[0028] According to a second preferred embodiment, the cuts 120 start from both the sides of the tube 10 and extend inwards along the welded portions 13 for a predetermined depth H (see Figure 1b).

[0029] The continuity of the tube 10, between one portion 13 and another, is maintained in this case only by the central part 12A of the welding line 12, which is not reached by the cuts 120; according to the shown non-limiting example, the extension of the central part 12A is about one third of the total.

[0030] In this case, the cuts 120 define at both sides of the tube, in each portion 13, two tubular, opposite segments 130, each of which has axial extension as the cuts 120.

[0031] The tubular segments 130 of each portion 13 are separated from the adjacent ones and permit independent axial compression of the spring 2, which do not interfere with the axial extension of the adjacent springs.

[0032] For both the embodiments, this feature is maintained unchanged also after the preparation of an assembly P (partially seen in Figure 2), formed by prefixed lengths of the spring tube 1, joined side by side to one another, until the length and width dimensions of the mattress to be produced are obtained.

[0033] Joining one spring tube 1 to another is obtained, e.g. by glue-spots C, applied from centered positions, with respect to the spring 2 height, up to the side of the tube without the cuts, for the first embodiment, as can be seen in figure 3a, and only in centered positions with respect to the spring 2 height for the second embodiment, as it can be seen in figure 3b. In both cases, the glue spots C are applied along the touching areas between one spring tube 1 and another.

[0034] According to the invention, the one with the cuts 120 along only one side of the tube 1, permits application of more glue spots C for each portion 13, for example there are three glue spots C visible in figure 3a, thus keeping the assembly joined with more strength.

[0035] The assembly P comprises longitudinal rows FL and transversal rows FT formed by the springs 2; according to the shown example, the spring tubes 1 are arranged to form the longitudinal rows FL, however the resulting softness is exactly the same both in the longitudinal extension and in the transversal extension.

[0036] As it is clearly seen in Figures 3a, 3b and 4, a single spring 2 of each longitudinal row FL, or of transversal row FT, can be compressed independently without transferring parts of the load to the adjacent springs, un-

like the spring packs of the prior art, mentioned in the introductory note.

[0037] Subsequently, according to the known technique, the assembly P of spring tubes 1 containing the springs 2, is covered with usual coverings (not shown), which form the mattress facings and sides. The advantageous functional aspect of the so obtained mattress lies in the fact that it offers a homogeneous softness, and consequently improved comfort, independently from orientation of the body lying thereon.

[0038] Obviously, the proposed spring tube 1 allows, if desired, to use springs 2 of different elastic reaction to obtain orthopedic mattresses with differentiated softness areas with different softness degrees, as there are no effects due to the spring interconnections caused by the tube 10, which are present instead in the spring packs of known type.

[0039] The proposed spring tube can be produced with the same technologies and apparatuses already used for known spring tubes, with obvious advantages. The cuts along the welded strips can be easily made in the same welding station or in a subsequent one.

[0040] Consequently, the proposed spring tube offer important functional advantages, which improve the mattresses characteristics, with practically no cost increase.

[0041] However, it is understood that what above has a value of a not limiting example, therefore possible detail changes remain in the same protective scope defined by the claims below.

Claims

1. A spring mattress, including
   a plurality of spring tubes (1) joined side by side, each spring tube (1) comprising
   a continuous tube (10) and
   a plurality of springs (2), enclosed into the tube (10) and arranged side by side, at a selected distance, with facing parts of the tube walls (11) between one spring (2) and a subsequent one, joined by welding lines (12) made parallel to the axes (A) of the springs (2), so that each spring (2) is contained in a respective portion (13) of said tube (10), closed and separated from the adjacent portions (13), wherein longitudinal cuts (120) are made starting from at least one side of the spring tube (1) and extending inwards along and into said welding lines (12), to form at least one tubular segment (130) for each portion (13) of said portions (13), said welding lines (12) having a predetermined minimum width (L), sufficient to keep the relevant portions (13) sealed after the cuts (120) are made,
   said spring mattress being **characterized in that** said spring tubes (1) are joined by a plurality of substantially vertically aligned glue spots (C), applied to each portion (13).

2. A spring mattress according to claim 1, **characterized in that** each cut of said cuts (120) is made in a central part of the relevant welding line (12).

3. A spring mattress according to anyone of the preceding claims, **characterized in that** said opposite cuts (120) extend inwards for a predetermined depths (H).

4. A spring mattress according to anyone of the preceding claims, **characterized in that** two opposite cuts (120) are made for each welding line (12) starting from opposite sides of the spring tube (1) and extending inwards.

5. A spring mattress according to anyone of the preceding claims, **characterized in that** said opposite cuts (120) have equal length.

6. A spring mattress according to anyone of the preceding claims, **characterized in that** said springs (2) have different elastic behavior, so as to define differentiated softness areas.

Patentansprüche

1. Federmatratze, enthaltend
   eine Vielzahl von Federhülsen (1), die Seite bei Seite verbunden sind, wobei jede Federhülse (1) eine durchgehende Röhre (10) umfasst, und
   eine Vielzahl von Federn (2), die in die Röhre (10) eingeschlossen und nebeneinander, bei einem ausgewählten Abstand, mit zueinander weisenden Teilen der Röhrenwände (11) zwischen einer Feder (2) und einer folgenden,
   verbunden durch Schweißlinien (12), die parallel zu den Achsen (A) der Federn (2) hergestellt sind, angeordnet sind, so dass jede Feder (2) in einem entsprechendem Teilbereich (13) der Röhre (10) enthalten, geschlossen und von den angrenzenden Teilbereichen (13) getrennt ist, wobei longitudinale Schnitte (120) von mindestens einer Seite der Federhülse (1) startend und sich einwärts entlang und in die Schweißlinien (12) verlängernd hergestellt sind, um mindestens ein röhrenförmiges Segment (130) für jeden Teilbereich (13) der Teilbereiche (13) zu bilden, wobei die Schweißlinien (12) eine vorbestimmte minimale Breite (L) aufweisen, die ausreichend ist, um die entsprechenden Teilbereiche (13) abgedichtet zu erhalten, nachdem die Schnitte (120) hergestellt sind, wobei
   die Federmatratze **dadurch gekennzeichnet ist, dass** die Federhülsen (1) durch eine Vielzahl von im Wesentlichen vertikal ausgerichteten Klebepunkten (C) verbunden sind, die in jedem Teilbereich (13) angebracht sind.

2. Federmatratze gemäß Anspruch 1, **dadurch gekennzeichnet, dass** jeder Schnitt der Schnitte (120) in einem zentralen Teil der entsprechenden Schweißlinie (12) hergestellt ist.

3. Federmatratze gemäß einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die gegenüberliegenden Schnitte (120) sich für vorbestimmte Tiefen (H) einwärts erstrecken.

4. Federmatratze gemäß einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** zwei gegenüberliegende Schnitte (120) für jede Schweißlinie (12), von gegenüberliegenden Seiten der Federhülse (1) beginnend und sich einwärts erstreckend, hergestellt sind

5. Federmatratze gemäß einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die gegenüberliegenden Schnitte (120) eine gleiche Länge aufweisen.

6. Federmatratze gemäß einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Federn (2) verschiedenes elastisches Verhalten aufweisen, um so differenzierte Weichheitsflächen zu definieren.

Revendications

1. Matelas à ressorts, comprenant :

une pluralité de tubes à ressorts (1) réunis côte à côte, chaque tube à ressorts (1) comprenant un tube continu (10), et
une pluralité de ressorts (2), renfermés dans le tube (10) et disposés côte à côte, à une distance sélectionnée, avec des parties en vis-à-vis des parois de tube (11) entre un ressort (2) et un ressort suivant, réunies par des lignes de soudure (12) réalisées parallèlement aux axes (A) des ressorts (2), de telle sorte que chaque ressort (2) soit contenu dans une partie respective (13) dudit tube (10), fermé et séparé vis-à-vis des parties adjacentes (13), des découpes longitudinales (120) étant réalisées à partir d'au moins un côté du tube à ressorts (1) et s'étendant vers l'intérieur le long desdites lignes de soudure (12) et à l'intérieur de celles-ci, de façon à former au moins un segment tubulaire (130) pour chaque partie (13) desdites parties (13), lesdites lignes de soudure (12) ayant une largeur minimale prédéterminée (L), suffisante pour maintenir les parties concernées (13) scellées après que les découpes (120) aient été effectuées,
ledit matelas à ressorts étant **caractérisé :**
en ce que lesdits tubes à ressorts (1) sont réunis par une pluralité de points de colle alignés de façon sensiblement verticale (C), appliqués à chaque partie (13).

2. Matelas à ressorts selon la revendication 1, **caractérisé en ce que** chaque découpe desdites découpes (120) est réalisée dans une partie centrale de la ligne de soudure concernée (12).

3. Matelas à ressorts selon l'une quelconque des revendications précédentes, **caractérisé en ce que** lesdites découpes opposées (120) s'étendent vers l'intérieur sur des profondeurs prédéterminées (H).

4. Matelas à ressorts selon l'une quelconque des revendications précédentes, **caractérisé en ce que** deux découpes opposées (120) sont réalisées pour chaque ligne de soudure (12) à partir de côtés opposées du tube à ressorts (1), et s'étendant vers l'intérieur.

5. Matelas à ressorts selon l'une quelconque des revendications précédentes, **caractérisé en ce que** lesdites découpes opposées (120) ont une longueur égale.

6. Matelas à ressorts selon l'une quelconque des revendications précédentes, **caractérisé en ce que** lesdits ressorts (2) ont un comportement élastique différent, de façon à définir des zones de mollesse différente.

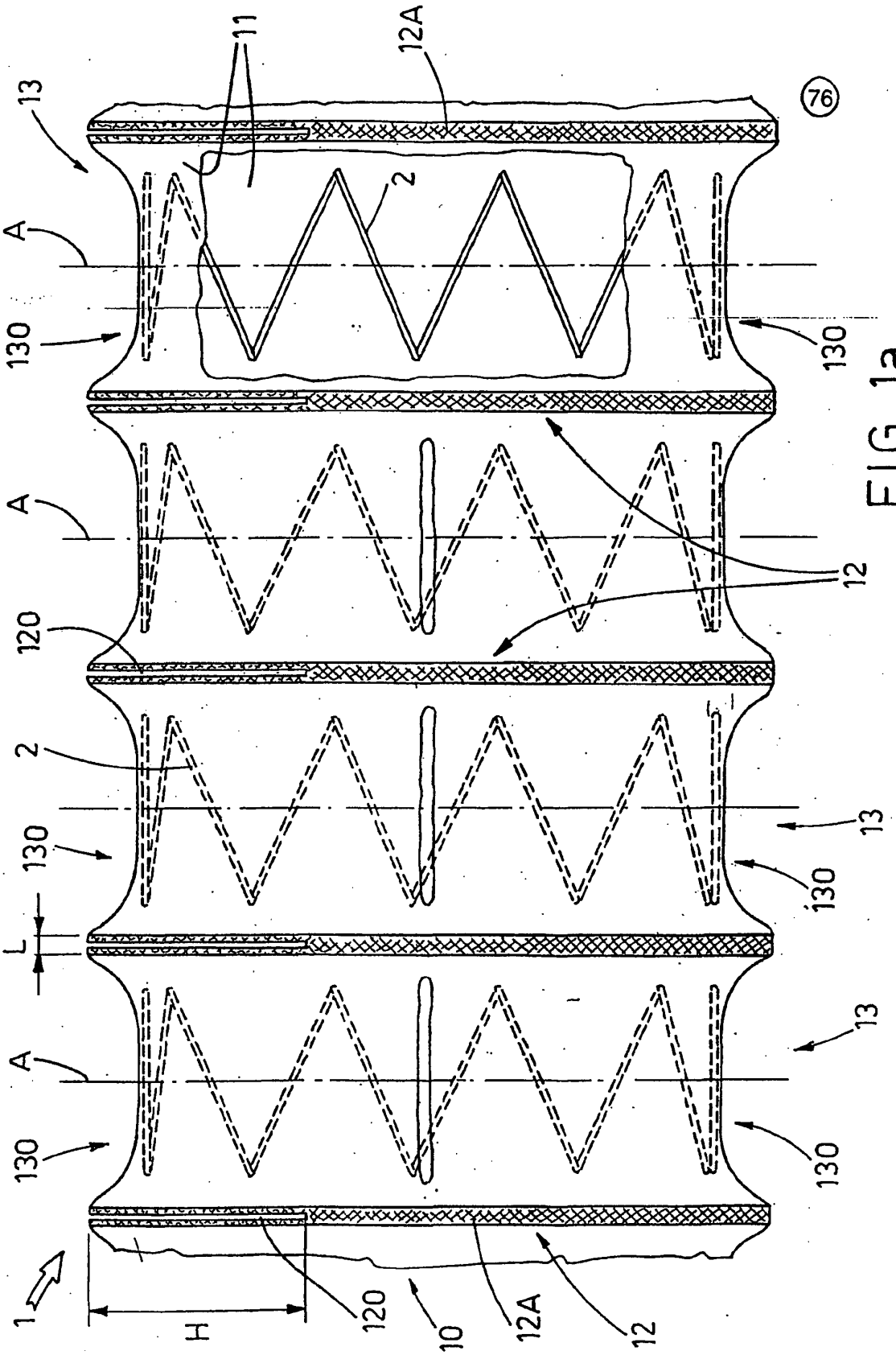

11
12A
13
76
2
A
130
130
A
12
120
2
130
13
130
L
A
13
130
130
1
H
120
10
12A
12

FIG. 1a

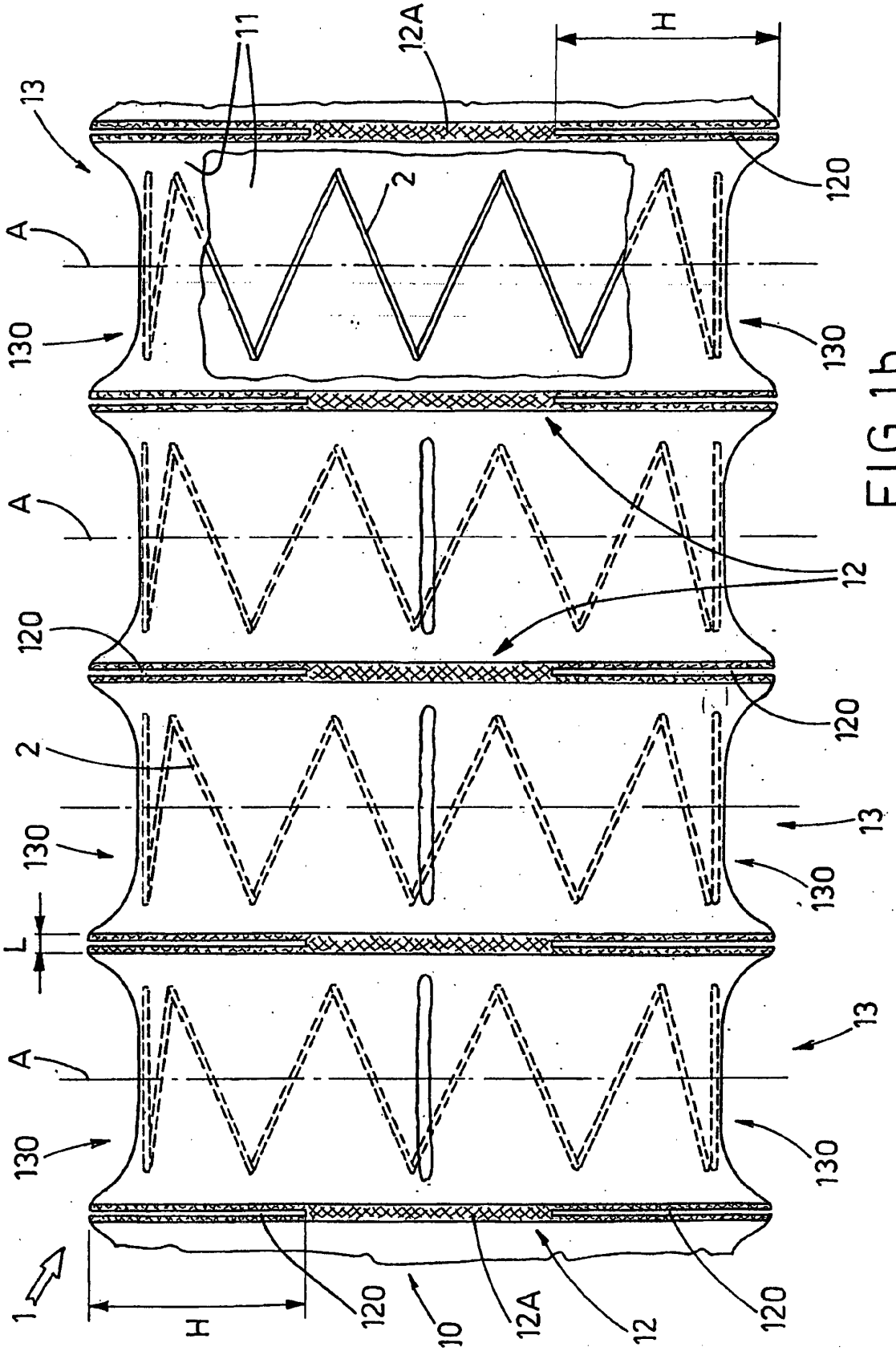


FIG.1b

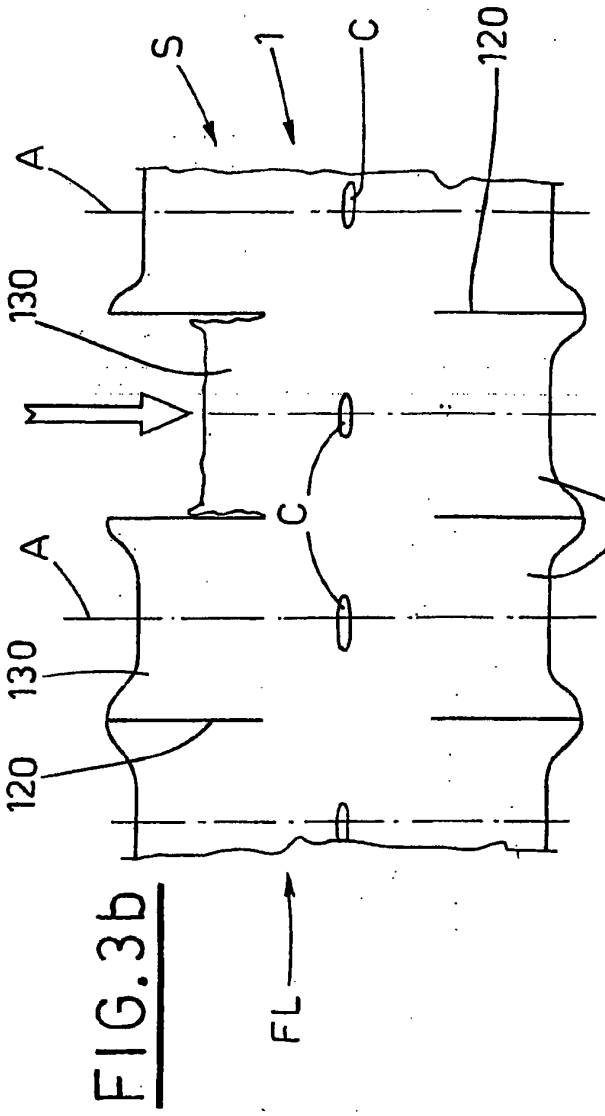


FIG.3b

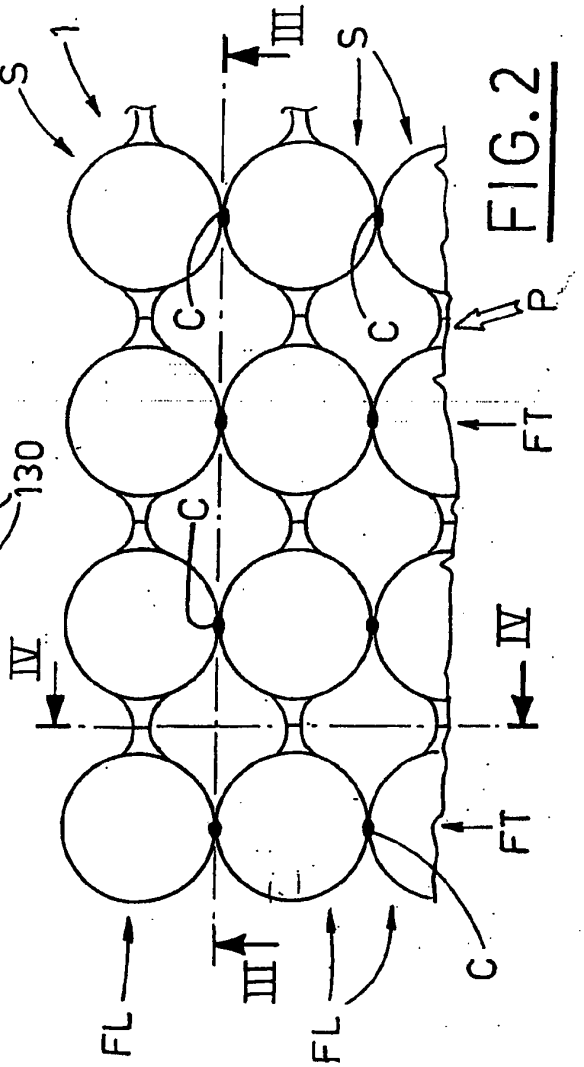


FIG.2

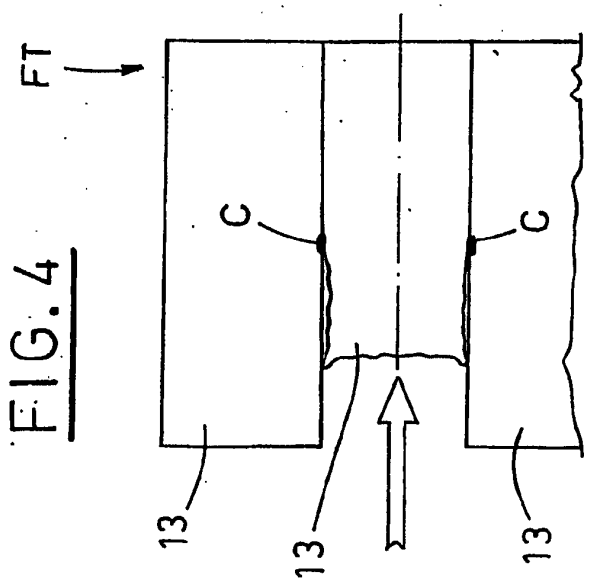


FIG.4

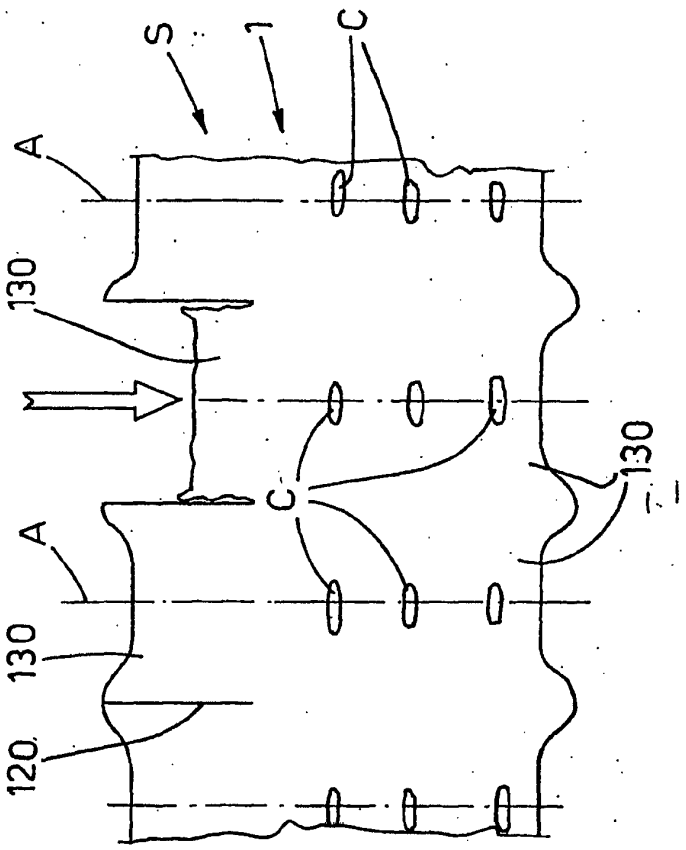


FIG. 3a

REFERENCES CITED IN THE DESCRIPTION

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