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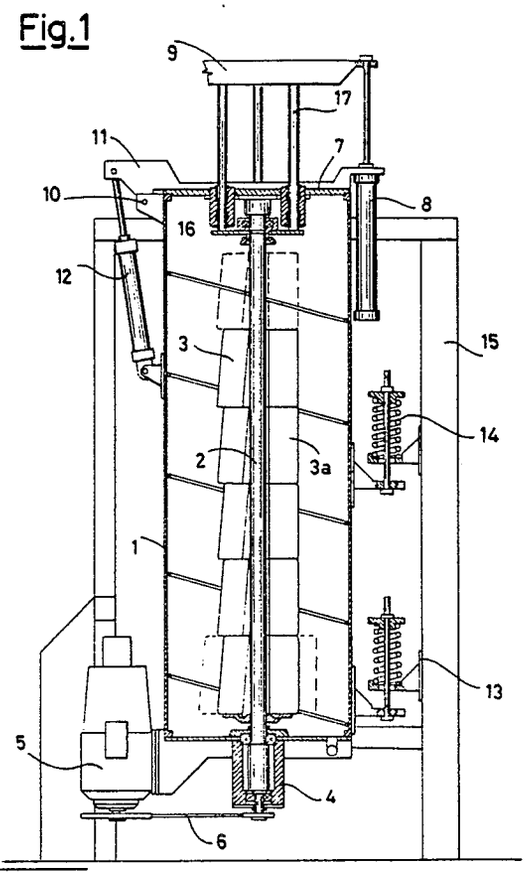
(54) Automatic machine for centrifuging yarn in reels in vertical piles after dyeing.

(57) In a cylindrical container (1) equipped along its vertical axis with a central shaft (2) rotated by a motor (5), by means of the belt transmission (6), the reels (3) are arranged, to be subjected to rotation, after being compressed by means of the plate (18), operated by the tie-rods (17), subjected to the action of the pneumatic cylinder (8).

The opening of the upper cover (7) by means of the action of the pneumatic cylinder (12) permits the loading and unloading of the reels in the cylinder (1).

Fig.1



EP 0 300 533 A1

Automatic machine for centrifuging yarn in reels in vertical piles after dyeing

The object of the present invention is the accomplishment of an automatic machine, by means of which it is possible to extract water by centrifuging the yarn in reels, arranged in piles after the dyeing operation. It is well known that yarn in reels is currently dried subsequently to the dyeing operation in baskets, in which the reels are inserted for example one at a time inside the walls, baskets which are then rotated at high speed, so that the water is extracted by the centrifugal effect.

The causality with which the reels are arranged inside the baskets does, however, make for a non-uniform degree of centrifuging, with the consequent possibility of a non-uniform extraction of water from the reel. On occasion, the operation is repeated, after moving the reels inside the container, so that a sufficiently uniform centrifuging action is obtained on all the reels themselves.

With the adoption of the present invention however, the reels, at the end of the dyeing operation, are inserted one on top of the other in vertical piles on a special shaft arranged at the centre of a container, which is rotated at high speed so as to reduce humidity to a minimum acceptable level.

With advantage prior to being rotated, the row of reels is compressed by means of a special piston so that it remains compact during the rotation, giving rise to a uniform centrifuging action of each reel.

A special automatic unit permits the loading of a series of cylindrical containers to be submitted to the rotating movement, and then their unloading, always automatically, bringing them on to other containers, for example with the shape of a parallelepiped or even on to the same cylindrical containers used at the start.

In this way it is possible to automate the entire processing cycle, for example within the scope of a complex automation programme with the robotization of the displacements of the containers in the overall compass of the system's complete automation.

In the drawings enclosed the essential parts of the machine according to the present invention are illustrated, also seen within the overall scope of the entire drying installation.

In them:

Fig. 1 represents, in the vertically sectioned view, the centrifuging container of a series of superimposed reels of yarn.

Fig. 2 represents in an enlarged scale the details of the container's upper closing device, in a vertical axial cross- section view.

Fig. 3 represents a schematic front view of the loading unit of a pair of containers.

Fig. 4 represents, in a partially sectioned side view, the details of an upright with a rotating support foot.

Fig. 5 represents the same detail in a view from the top down.

Fig. 6 represents a variation of the accomplishment of the machine according to the invention, with six cylindrical containers and one loading and unloading cylindrical container for the reels to be centrifuged.

Fig. 7 represents, in a view from the top down, the entire installation with six centrifuging containers, one cylindrical loading container and two unloading containers in the shape of a paralleleliped.

As can be seen from Fig. 1, the unit includes a container 1, of a cylindrical shape, at the centre of which there is a vertical shaft 2, on which the reels 3 to be dried are inserted, for example in the shape of a truncated cone or the reels 3a of a cylindrical shape.

The shaft 2 is supported by a base 4 and is rotated at high speed by the electrical motor 5, by means of the belt transmission 6.

At its upper end the container 1 is equipped with the cover 7 which can be opened, on which the pneumatic cylinders 8 have been fitted, whose pistons are connected by means of the bracket 9, to the tie-rods 17, which compress the row of reels subjected to the centrifuging action inside the container.

The tie-rods 17 are held in place by a pair of bushes 16, which are integral with the cover 7 which can be opened.

The entire unit comprising the cover 7 and the cylinders 8 can be rotated on the pivot 10, which connects a fixed bracket to the container 1 by means of the support 11, which is integral with the cover 7.

The movement of rotation of the support 11 on the pivot 10 is controlled by the pneumatic cylinder 12, which is integral with the container 1.

The latter is mounted on brackets which are integral with the fixed frame 15, with the interposition of the springs 13 and 14, for example in the number of four, connected to brackets which are integral with the container 1.

The motor 5 rotates the shaft 2 at high speed, together with the reels inserted on it.

The latter are kept compressed by the plate 18 (Fig. 2) which is integral with the sleeve 19, rotating on the bearing 20 and equipped with a pair of gaskets 21, which provides the necessary protection against water splashes.

Obviously the action of the pneumatic cylinders

8 (Fig. 1) on the bracket 9, leads to a lowering of the tie-rods 17, together with the head disc 22 integral with the sleeve 19, the disc compressing the reels of yarn, with the interposition of the disc 23.

The unloading of each container is executed by means of a device, better illustrated in Fig.s 3, 4 and 5, comprising a vertical column 24 sliding outside the structure with the interposition of the horizontal sliding guides 25 and equipped with a horizontal arm 26 which can move vertically along the column 24.

The arm 26 supports a carriage 27 which can move transversally and equipped with four rods (28) for collecting and depositing the reels.

Said rods, better visible in Fig. 4, are equipped internally with pins 29 which, pivoted and appropriately operated in the upper part, eccentrically rotate the transfer tags 30 which can move through 90° from the position in which they support the reel 3 to a position, in which the reels are free to rest on the bottom of the cylindrical containers 1.

In particular in Fig. 3, while the loading unit is proceeding with the insertion of the reels to be dried inside the cylindrical container 1, a second cylindrical container 31 is closed by the bracket 32 for example while it is waiting to be subjected to the centrifuging action.

In the embodiment illustrated in Fig. 6 the reels mounted on the cylindrical container 33 are moved by the mobile arm 36 to the cylindrical containers 1, where they are centrifuged and then replaced in the same cylindrical container 33.

In Fig. 7 we can see a series of cylindrical containers 1, for example in the number of six, on one side of which the cylindrical reel supporting container 33 can be seen, on which the reels are mounted in concentric rows to be then moved to the cylindrical containers 1 and then unloaded on the containers in the shape of a parallelepiped 34 and 35.

Naturally all these particular arrangements of the centrifuging device can also be changed, without thus departing from the scope of the invention.

Claims

1. Automatic machine for centrifuging yarn in reels in vertical piles after dyeing, comprising one or more cylindrical containers, within which the reels are centrifuged, characterized in that inside each cylindrical container (1) there is a shaft (2) on which the reels of yarn (3, 3a) to be centrifuged are inserted in vertical piles, reels which are brought to a rapid rotation, by the motor (5), by means of the belt transmission (6) so that a uniform centrifuging action of the reels is obtained.

2. Automatic machine for centrifuging yarn in reels in vertical piles, according to claim 1, characterized in that a plate (18) is lowered, by means of the tie-rods (17), connected to the cylinders (8), so that the pack of reels inserted on the shaft (2) is compressed, by means of the sleeve (19), equipped with flanges (22), freely rotatable on the bearing (20), integral with the flange (18).

3. Automatic machine for centrifuging yarn in reels in vertical piles, according to claims 1 and 2, characterized in that the plate (7), together with the pneumatic cylinder (8) and the movable tie-rods (17) is rotatable on the pivot (10), under the action of the pneumatic cylinder (12), so as to allow the opening of the cylindrical container (1) and the loading and unloading of the reels in the container itself.

4. Automatic machine for centrifuging yarn in reels in vertical piles, according to claims from 1 to 3, characterized in that the entire unit comprising the container (1) with its closing cover (7) and the control motor (5) is suspended, by means of compression springs (13 and 14), on brackets which are integral with the fixed frame (15), so that the rotating unit is extremely elastic.

5. Automatic machine for centrifuging yarn in reels in vertical piles, according to claims from 1 to 4, characterized in that a loading device, comprising the vertical rods (28) which are integral with the carriage (27) which is movable along the bar (26) supported by the vertical upright (24) which is movable on the horizontal guides (25), permits an easier loading and unloading of the reels in the cylindrical containers (1), by taking them from a special container (33) and bringing them on to other containers (34 and 35) after centrifuging has taken place.

6. Automatic machine for centrifuging yarn in reels in vertical piles, according to claim 5, characterized in that the mobile rods (28) are equipped internally with small rotating tags (30), so as to support the reels to be loaded and unloaded from the cylindrical containers (1).

Fig.1

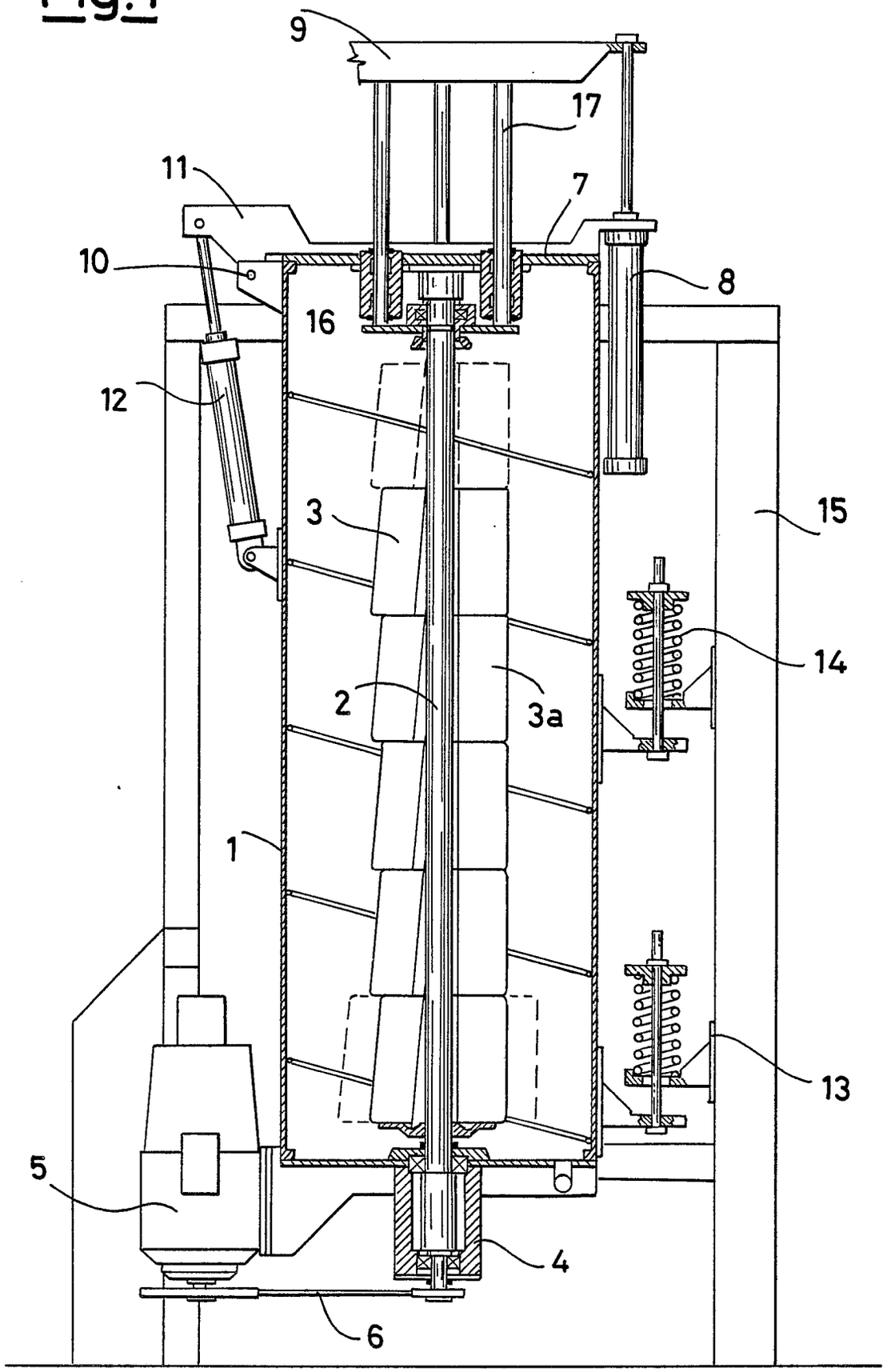


Fig.2

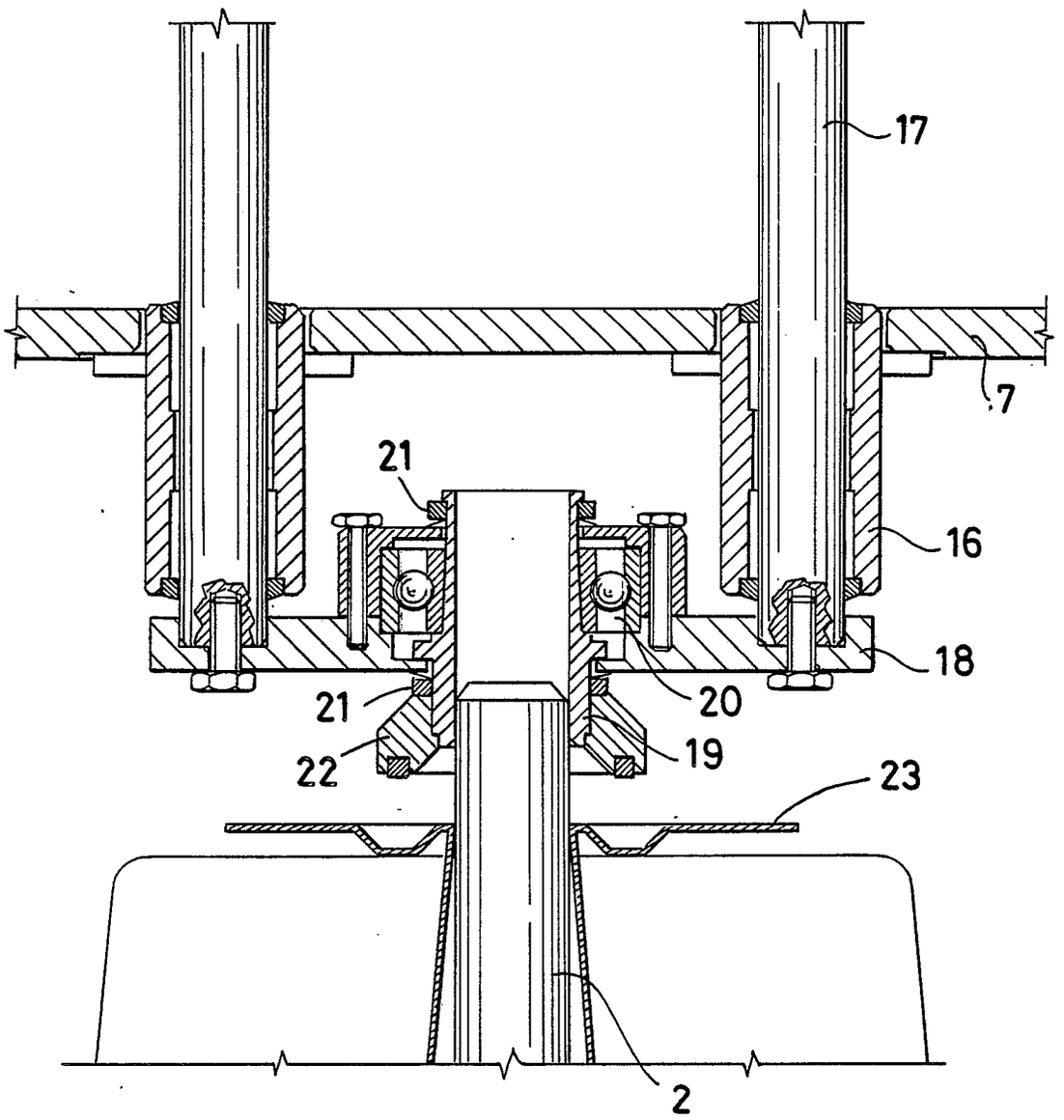


Fig.3

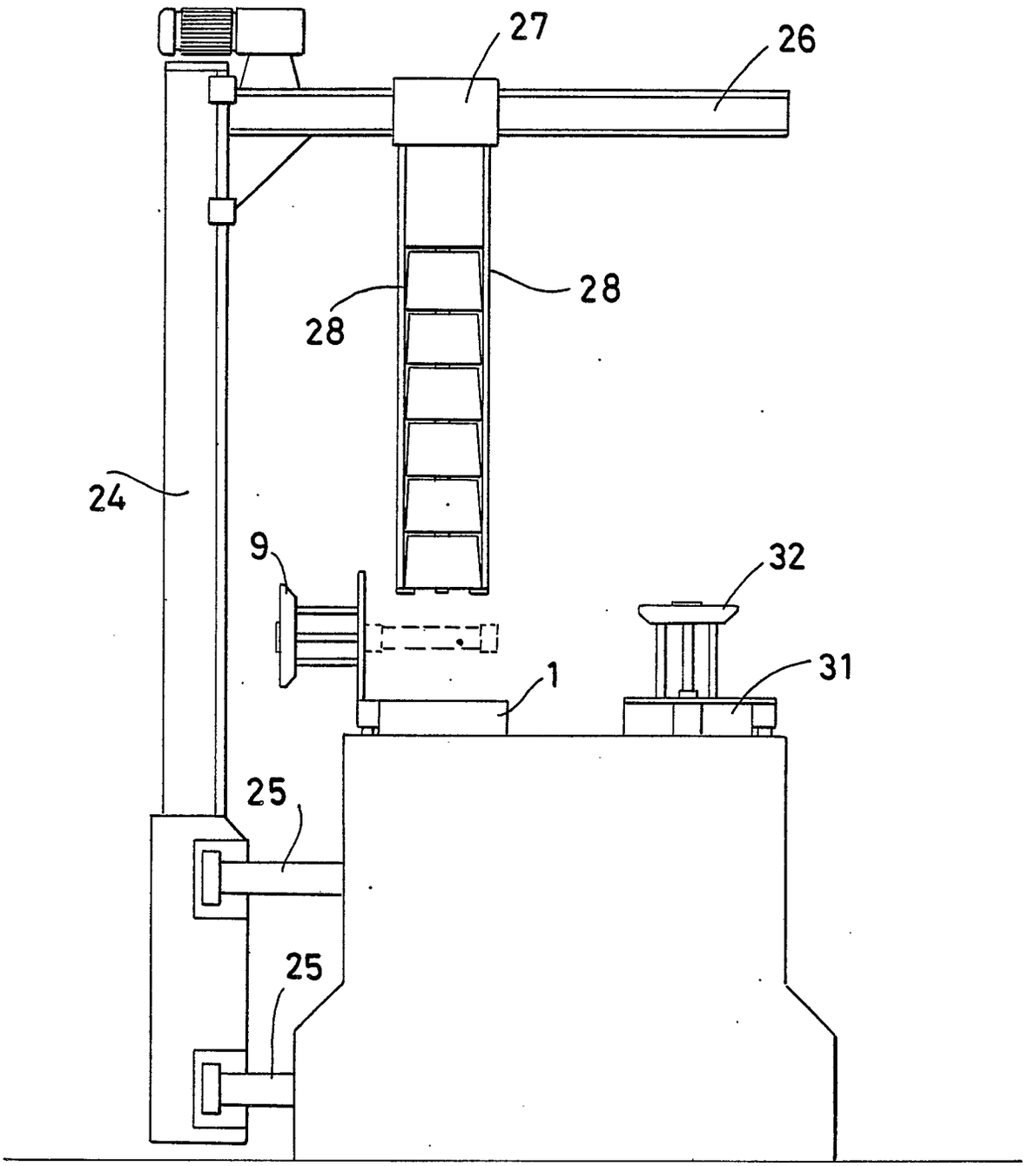


Fig.6

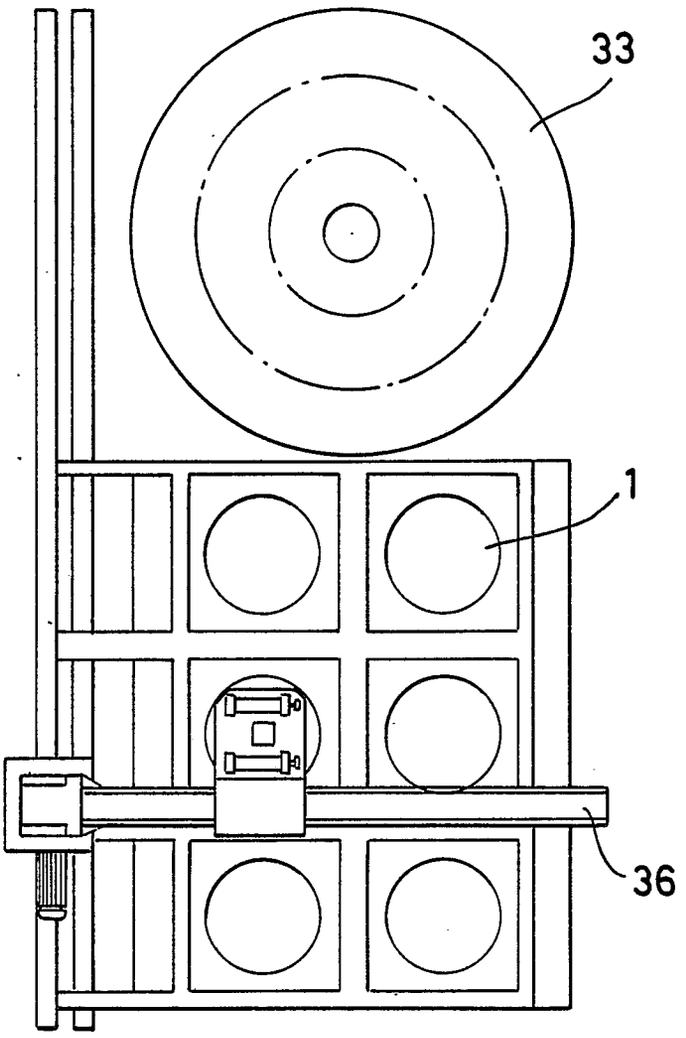
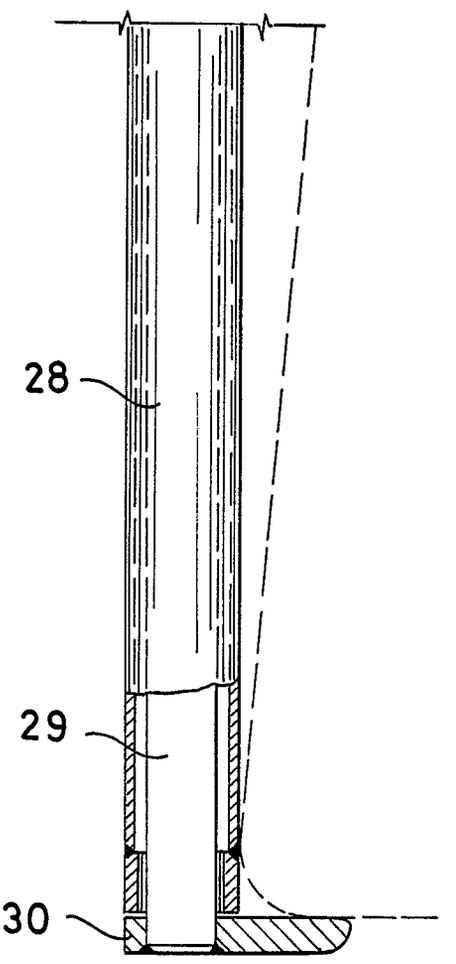


Fig.4



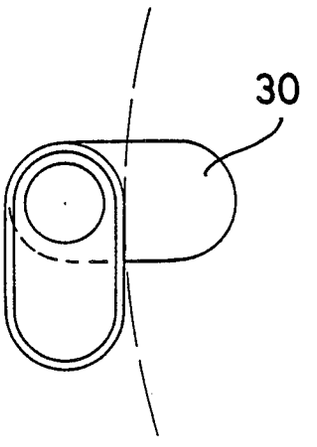
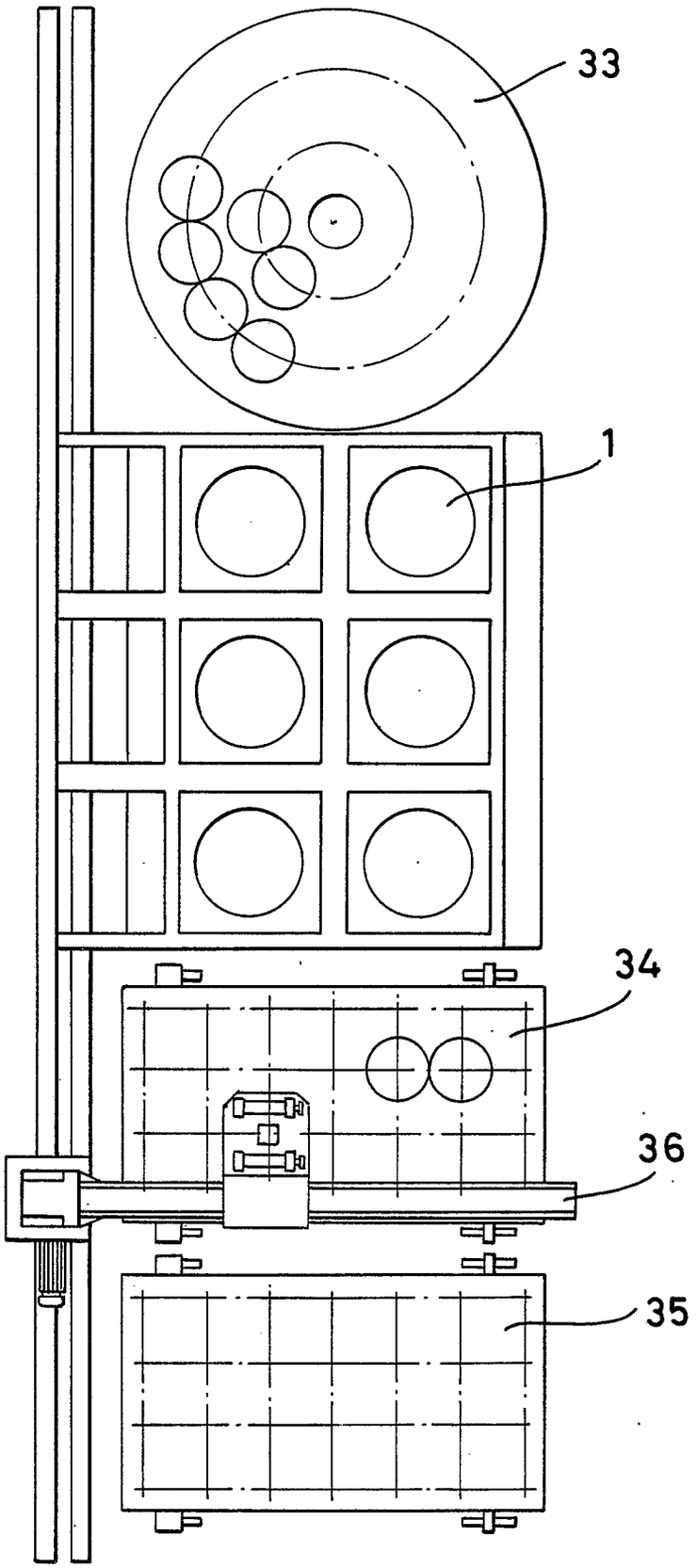


Fig.5

Fig.7



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EUROPEAN SEARCH REPORT

Application Number

EP 88 20 1369

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
X,P	FR-A-2 594 451 (VANTOUROUT & CHARDON) * Whole document *	1,4-6	D 06 B 15/10
X	EP-A-0 134 180 (ROBATEL) * Abstract *	1,4-6	
X	FR-A-1 219 947 (FRAUCHIGER) * Whole document *	1,2	
X	CH-A- 410 837 (FRAUCHIGER) * Whole document *	1	
A	DE-A-2 147 458 (KRANTZ)		
A	GB-A-2 105 021 (TAKEJI ITOH)		

TECHNICAL FIELDS SEARCHED (Int. Cl.4)

D 06 B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	14-10-1988	PETIT J.P.

CATEGORY OF CITED DOCUMENTS

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