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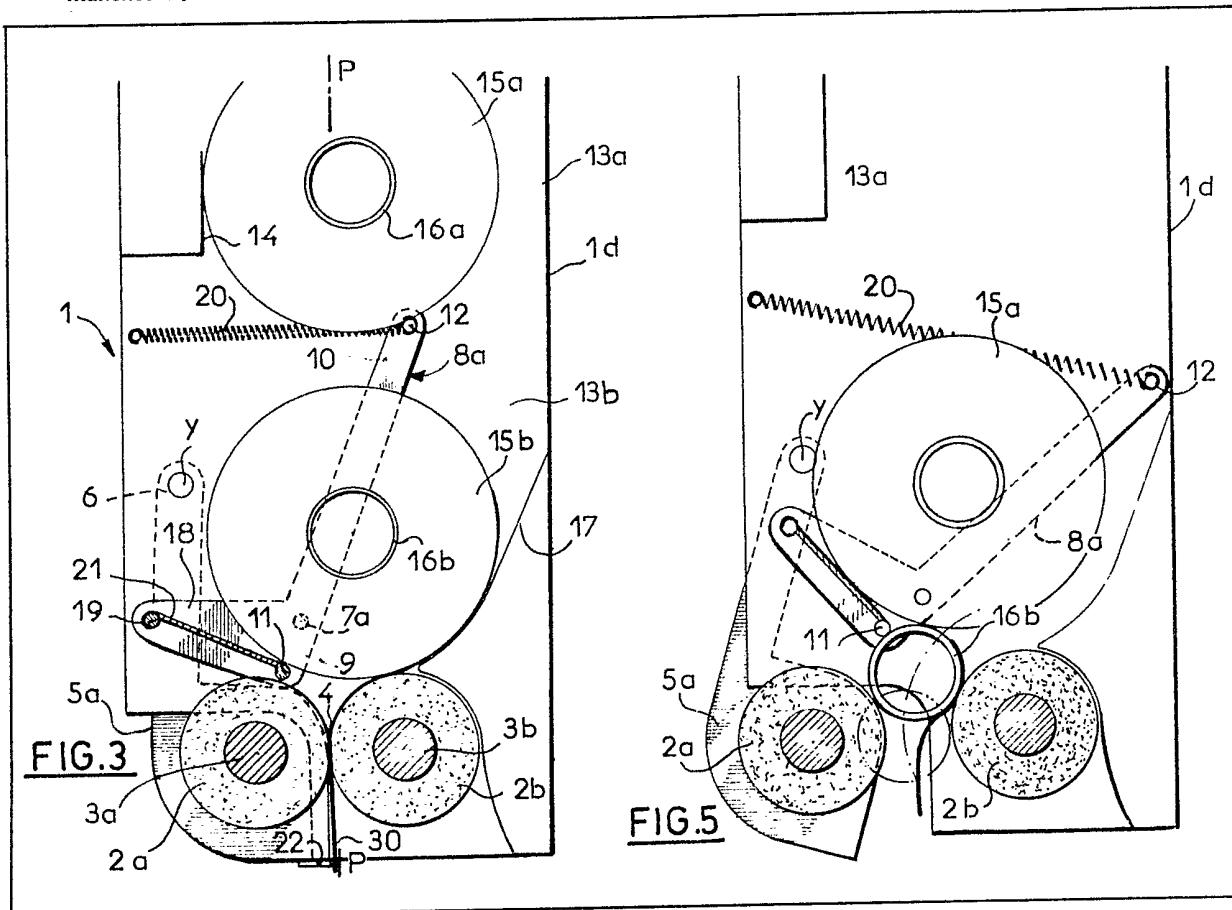
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**(54) Apparatus for dispensing sheet material, e.g. paper towelling, from rolls**

(57) In apparatus of the type comprising a case (1) which has at an upper cavity (13a) for a spare roll (15a) and a lower cavity (13b) for a roll in use, a lower dispensing passage (4), and a withdrawable retaining means (12) interposed between the two cavities, the retaining means (12) is actuated by a bearing means (11) positioned in the lower cavity and which is not accessible from outside the case. The means (11) and (12) are in the form of rods carried between

two pivotally mounted arms (8a).

The rod (11) in its retaining position, where it supports the lower roll, is at a distance from roller 2b, which together with a movable roller (2a) defines the dispensing passage (4), less than the diameter of the cylindrical roll support (16b). Pulling on the final length of material attached to the support (16b) causes both roller (2a) and rod (11) to move, thus allowing empty support (16b) to be expelled and rod (12) to move and allow the spare roll to drop down. Spring (20) then causes rods (11) and (12) to return to their retaining positions.



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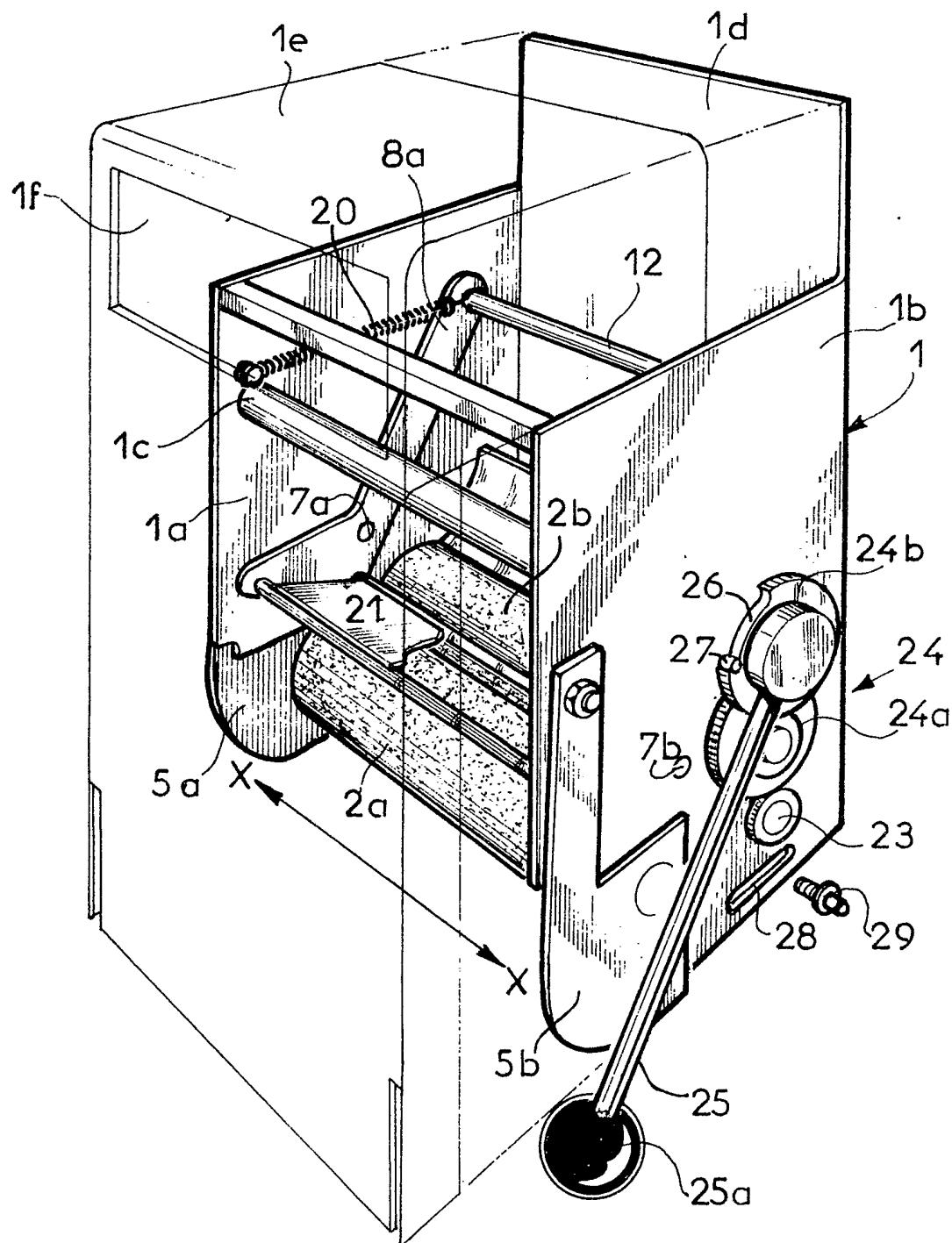
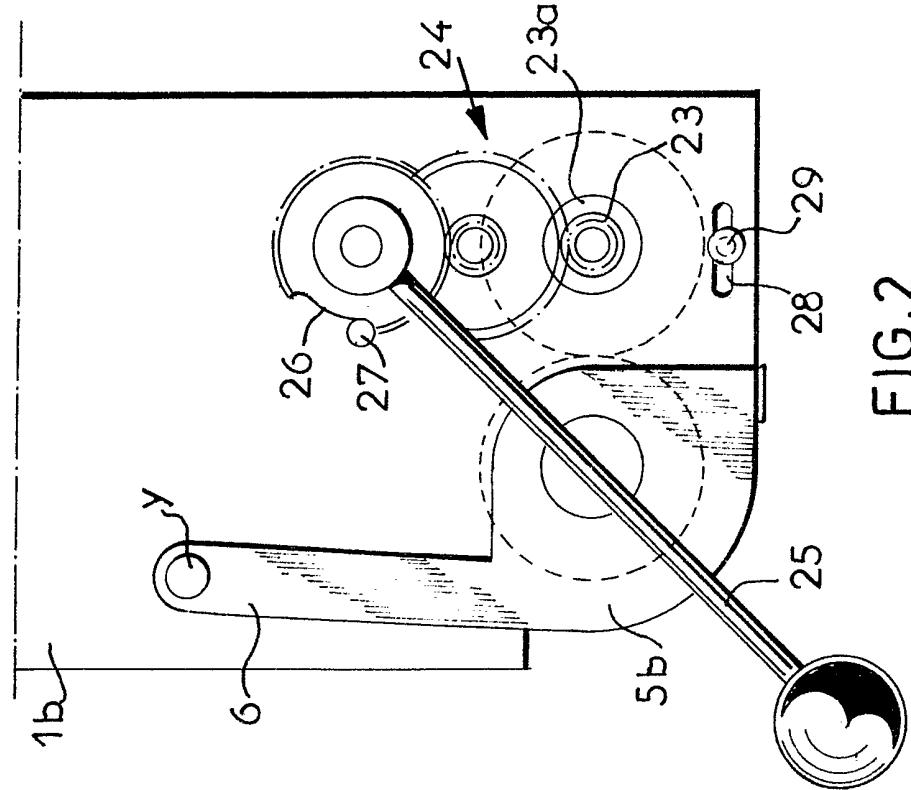
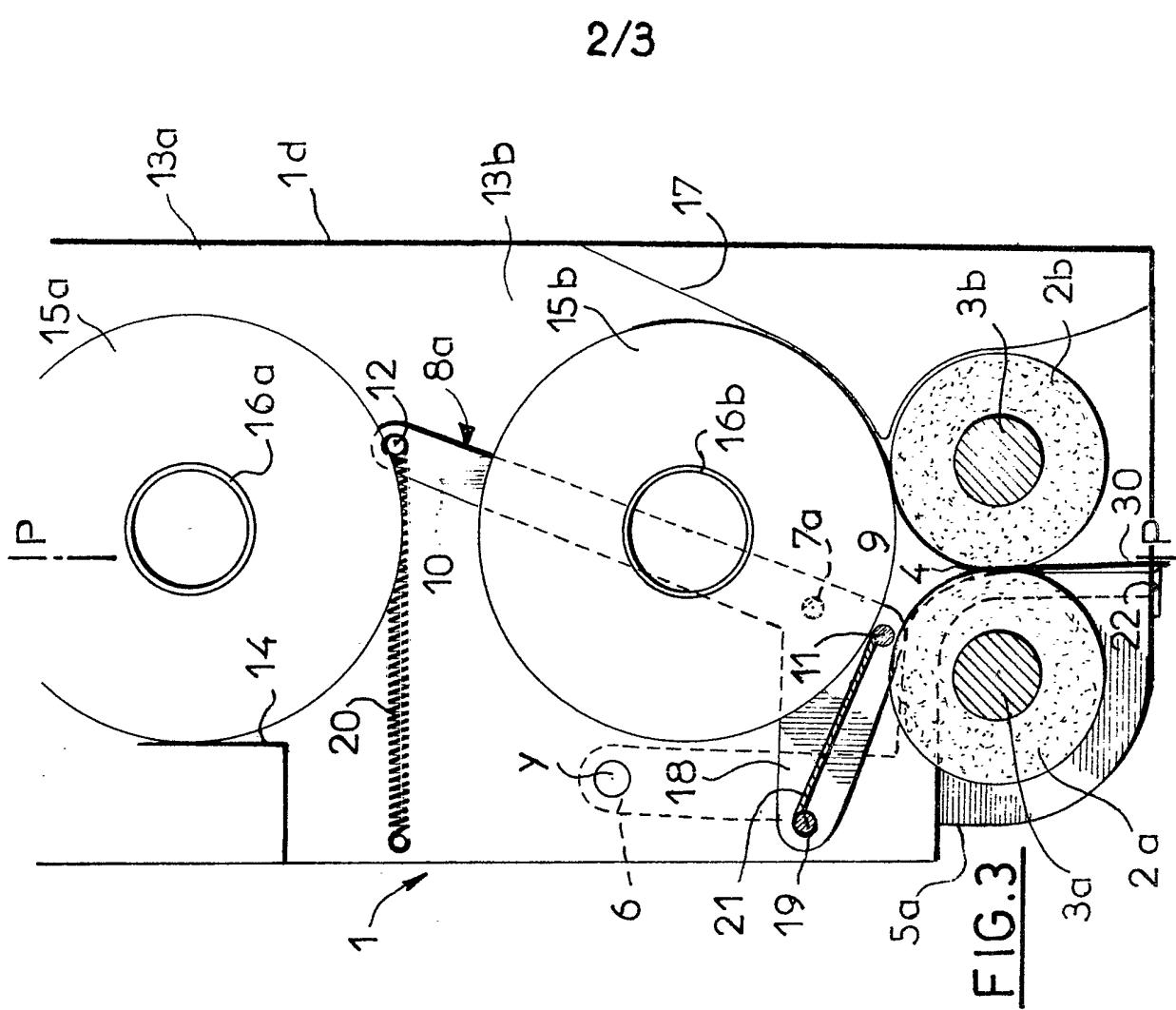


FIG.1



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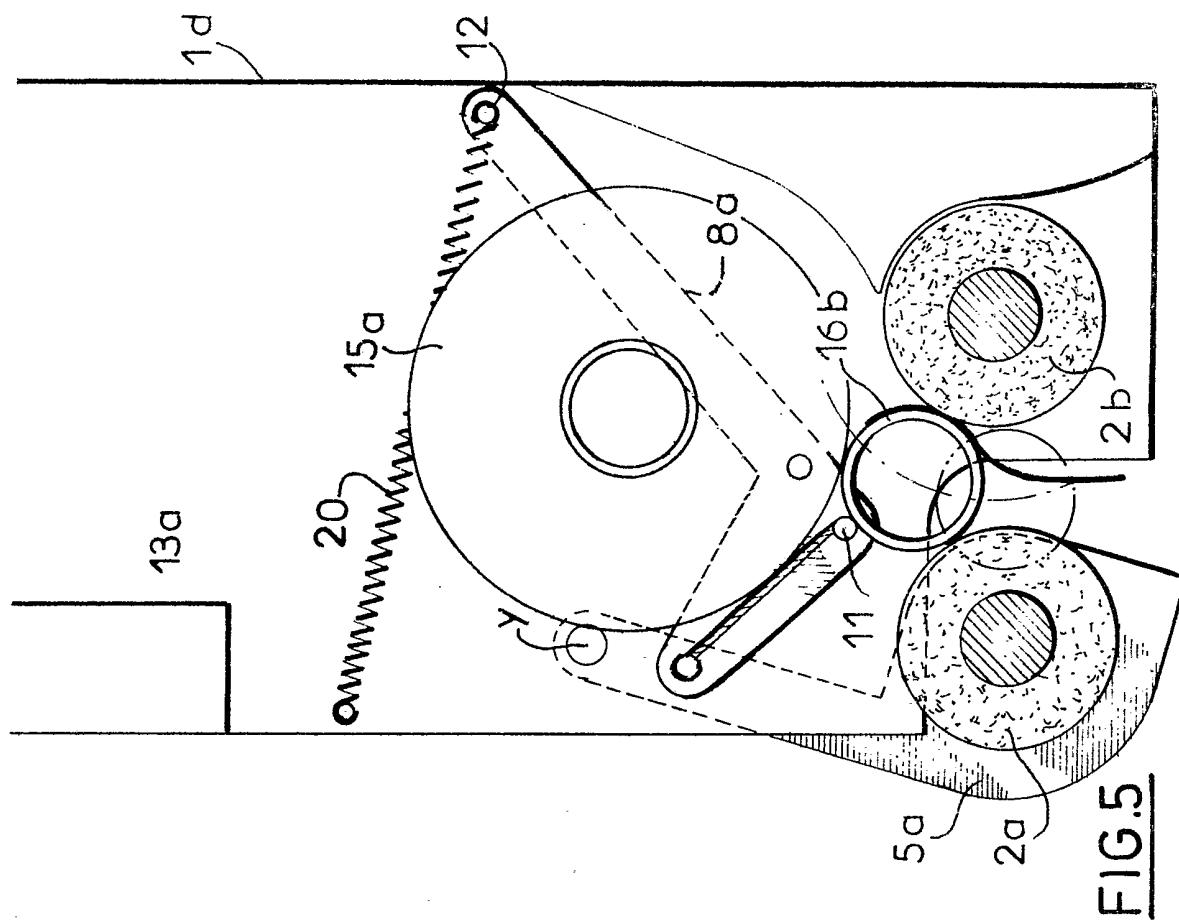


FIG. 5

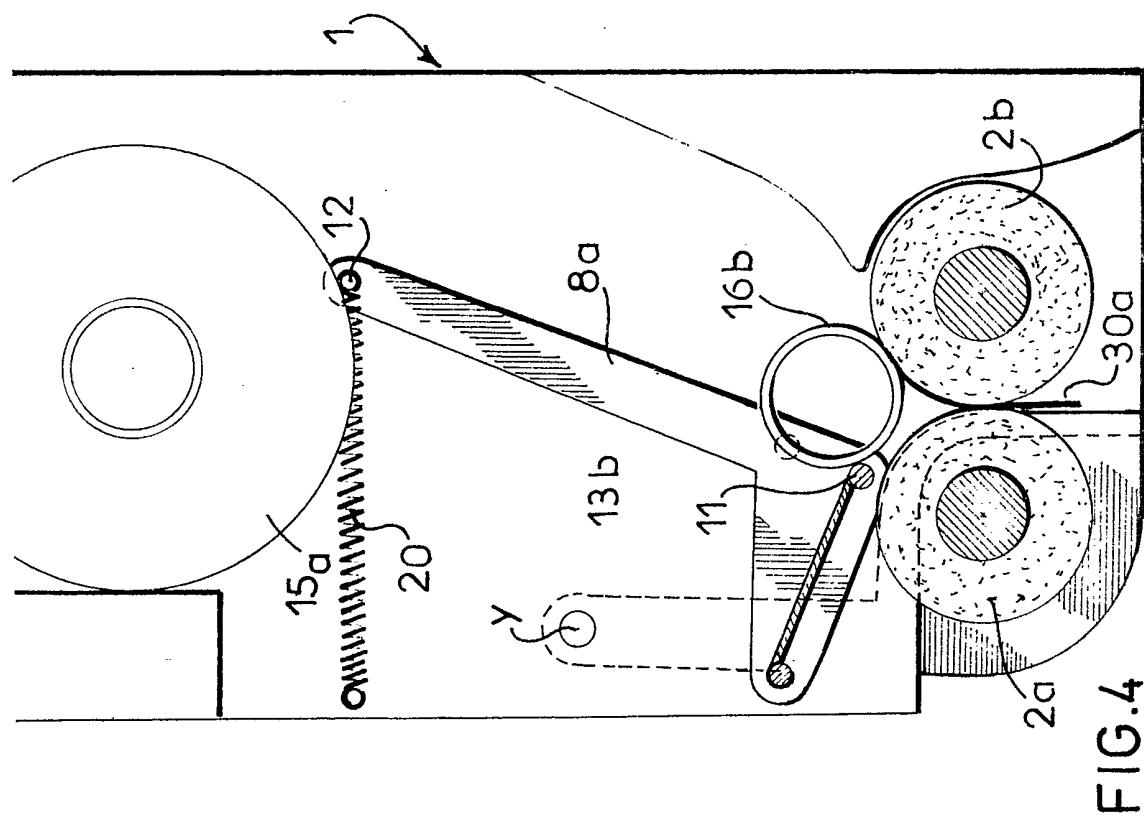


FIG. 4

## SPECIFICATION

## Improvements in apparatus for dispensing products in rolls and in particular paper hand-towels

5 The present invention relates to apparatus for dispensing sheet products supplied in the form of continuous bands in rolls on cylindrical supports, such as hand-towels in rolls, of the type comprising a case which has, on one hand, at least 10 two cavities which are disposed vertically one above the other and are so dimensioned as to be each capable of receiving a roll, the lower cavity having a fixed support member for the roll and, on the other hand, in the lower part of said lower 15 cavity means defining an elongated dispensing passage whose section roughly corresponds to the section of the sheet product, there being provided between the two cavities retaining means which are movable between a retaining position and a 20 withdrawn position and are connected to driving means which are movable between two positions respectively associated with the positions of the retaining means.

Apparatus of this type are already known, for 25 example from U.S. patent No. 2 871 078 (more particularly relating to rolls of toilet paper), in which the retaining means comprise a support in the form of a semi-cylindrical cradle which is mounted to be rotatable about a horizontal axis and 30 connected to a shifting handle located outside the case and constituting the driving means.

Now, a serious drawback of such apparatus is that they have driving means which are accessible from the exterior and may be shifted, accidentally 35 or with bad intentions, while the lower roll has not yet been fully used, so that the upper roll bears against the lower roll and is thus liable to jam the roll being used or at least render the handling of the latter difficult.

40 Consequently an object of the present invention is to provide an apparatus of the aforementioned type in which the upper or reserve roll is released automatically and solely when the roll in use has been fully used.

45 The invention provides an apparatus of the aforementioned type, wherein the driving means is disposed inside the case and above said elongated passage and is located, in the position which corresponds to said retaining position, at a 50 distance from the fixed support member of the lower cavity which is less than the diameter of the roll of product and at a distance from one of the two elongated members defining said passage forming a support member, is less than the 55 diameter of a cylindrical support, whereas, in the position which corresponds to said withdrawn position, it can be located at a distance from said elongated member which is equal to said diameter of the cylindrical support, elastically yieldable 60 return means being provided for returning said driving means to the retaining position, and the upper cavity also having a fixed support member for the roller, the retaining member being, in the retaining position, located at a distance from said support

65 member which is less than the diameter of the roll of product and, in the withdrawn position, located at a distance from said member which exceeds said diameter, the cylindrical supports of the rolls being each provided with a flexible seizing 70 member fixed to the cylindrical wall of said support.

With this arrangement, when the roll in use has been fully used, its cylindrical support bears against said elongated member of the passage 75 and against the driving means, the flexible seizing member fixed to said support then hanging from the latter in and beyond the dispensing passage so that the user may take hold of and pull on said seizing member and on the cylindrical support 80 which then urges the driving means back to its withdrawn position as to allow the extraction of said support, while the driving means also drives to the withdrawn position the retaining means which thus releases the roll in reserve which bore 85 thereon and on the fixed support member of the upper cavity and which consequently can place itself in the position of use in the lower cavity.

In a particularly advantageous embodiment of the invention, the driving means and the retaining 90 means may be disposed at the ends of the arms of two levers which are mounted on the case to pivot about a horizontal axis and may be formed by two horizontal elongated members in the form of a rod extending parallel to the direction of the 95 dispensing passage, the levers being disposed in the vicinity of the sides of the case which are perpendicular to said direction. This arrangement ensures that the whole of the apparatus operates in a particularly smooth and precise 100 manner.

Advantageously, it may be arranged that, in the case where the means defining an elongated passage are formed by two downwardly movable nipping members, one of these members 105 constitutes the elongated support member, while the other elongated support member is a movable member which is arranged to be maintained in the nipping position under the effect of its weight. In this way, when the user exerts a pulling force on 110 the seizing member of an empty cylindrical support and the latter has urged back the driving means, this support may then also laterally urge back said movable member so as to enable the cylindrical support to be fully extracted from the 115 apparatus.

The apparatus according to the invention may be used to advantage in public premises and local collectivities where there is a high consumption of rolls and where there is a higher risk of voluntary 120 or involuntary damage.

Further features and advantages of the invention will be apparent from the ensuing description which is given merely by way of example with reference to the accompanying 125 drawings in which:

Fig. 1 is a perspective view of an apparatus for dispensing hand-towels in rolls according to the invention;

Fig. 2 is a partial side elevational view of this

apparatus illustrating more particularly the outer actuating means thereof, and

Figs. 3 to 5 are sectional views of this apparatus illustrating three different and 5 successive stages in its operation.

The illustrated apparatus (Fig. 1) comprises a case 1 which has a roughly parallelepipedic shape and two lateral vertical sides or support side walls 1a and 1b which are interconnected in the front by 10 a cross-member 1c and at the rear by a vertical inner end side 1d, the case being completed by a detachable casing 1e shown in fine line separated from the rest of the case. The casing 1e has an upper side and a front side in which front side 15 there may be formed a transparent window 1f so that the upper part of the interior of the case can be observed.

Disposed inside the case in the lower end thereof are two cylinders 2a and 2b of rubber fixed 20 to shafts 3a and 3b (Fig. 3) which extend in a horizontal direction X—X (Fig. 1) perpendicular to the side walls 1a and 1b and journaled in the latter, the two cylinders 2a and 2b extending up to the vicinity of these side walls. The axes of the two 25 shafts 3a and 3b are contained in a common horizontal plane and the distance therebetween is such that the two cylinders are practically in contact with each other and define therebetween an extremely small nip gap 4 (Fig. 3), which may 30 even be nonexistent, owing to the elasticity of the rubber from which the cylinders are made. This nip gap or line has an elongated horizontal shape and constitutes the dispensing passage of the apparatus, this line or gap 4 being located in a 35 vertical plane P—P.

The cylinder 2b disposed adjacent the rear wall 1d of the case is mounted on a fixed part of the side walls 1a and 1b, while the front cylinder 2a is journaled on the horizontal branches of two 40 L-shaped support members 5a and 5b (Fig. 1) the vertical branches of which are mounted adjacent their ends 6 (Fig. 2) on the side walls 1a and 1b to respectively pivot about a horizontal pivot pin Y which is located in front of and distinctly above 45 the axis of the cylinder 2a.

Disposed above the upper level of the two cylinders and slightly in front of the nip gap 4 but behind the axis of the cylinder 2a are two journals 7a and 7b (Figs. 1 and 3) which are fixed to the 50 side walls 1a and 1b and on which two levers 8a and 8b are pivotally mounted (Fig. 3). Each of these levers has a short lower arm 9 and a longer upper arm 10. The ends of the two short arms 9 are interconnected by a driving rod 11 (Fig. 3) and 55 the two ends of the long arms 10 are interconnected by a retaining rod 12.

In the normal position of use of the apparatus illustrated in Figs. 1 and 3, the long arms 10 of the two levers are slightly upwardly and rearwardly 60 inclined so that the retaining rod 12, which extends in the direction X—X in the same way as the rod 11, is disposed slightly to the rear of the vertical plane P—P (Fig. 3). The length of the arms 10 is moreover sufficient to ensure that the rod 12 65 is located in an upper part of the case which

constitutes a first cavity 3a, the lower part of the case below the level of this rod 12 constituting a second cavity 13b.

In the upper cavity 3a there is provided 70 adjacent the front side of the case a support member 14 which also extends parallel to the direction X—X and is disposed above the front part of the cylinder 2a. In this way a reserve hand-towel roll 15a may be kept in the upper cavity 75 13a, this roll bearing against the support member 14 and against the retaining rod 12 so that the axis of the mandrel or cylindrical support (for example of cardboard) 16a on which this roll is wound is slightly to the rear of the vertical plane 80 P—P but in front of the rod 12.

Placed in the lower cavity 13b is a roll 15b which is in use and formed on a mandrel or cylindrical support 16b whose axis is roughly vertically below the axis of the roll 15a. The roll 85 15b bears against the driving rod 11 and against the upper part of the rear cylinder 2b and may possibly bear by its rear face against a transverse deflector 17 which is inclined forwardly and downwardly and secured to the rear wall 1d so as 90 to reach the vicinity of the upper part of the rear cylinder 2b.

In this normal position of operation, the rod 11 is disposed very slightly above the upper part of the front cylinder 2a and slightly in front of the 95 journals 7a and 7b. The short arms 9 of the two levers 8a and 8b have a forwardly bent part 18 and the ends of these parts are interconnected by a transverse rod 19. Connected to the ends of the long arms 10 of the levers are two return springs 100 20 which are disposed roughly horizontally and extend forwardly and are connected to the case. The rods 11 and 19 are interconnected by a deflector plate 21.

The L-shaped supports 5a and 5b for the front 105 cylinder 2a are interconnected on their lower and rear edges by a bar in the form of a saw 22 whose cutting edge is, in the normal position of operation, contained in the vertical plate P—P below the nip gap 4.

110 The end portion of the shaft 3b of the rear cylinder which is journaled in the side wall 1b is fixed in a free-wheel 23 (Fig. 2) whose outer ring 23a carries teeth and constitutes the output gear of a speed-reducing gear train 24 having a double 115 intermediate gear 24a and an input gear 24b. The latter is mounted vertically above the other gears and is rigid with an actuating lever 25 of great length provided with a knob 25a and extending forwardly and downwardly from the gear 24b. The 120 teeth of the gear 24b are interrupted in a part of its periphery by a notch 26 which receives a stud 27 fixed to the side wall 1b so that the angular travel of the gear 24b and lever 25 is limited by the contact of either end of the notch 26 with the 125 stud 27. This angular travel is, for example, of the order of 45°, but the speed-reduction ratio of the gear train 24 is such that several complete rotations of the rear cylinder 2b correspond to this travel of 45°.

130 Provided on the same side wall 1b and in the

lower part of the latter below the gear train 24 is a slot 28 in which is movable and adjustable a stop member 29 which is so located in the path of the lever 25 as to be encountered by the latter in the course of its angular travel allowed by the notch 26, so that the different positions of this stop member 29 allow different travels of the lever 25, these travels being less than those allowed by the abutments of the stud 27 against the ends of the notch 26 which correspond to the maximum travel of the lever.

The apparatus just described operates in the following manner:

The apparatus is normally in the position shown in Fig. 3 in which a roll 15b in use is placed in the lower cavity 13b and bears on the rod 11 and the rear cylinder 2b, while a reserve roll 15a is placed in the upper cavity 13a and bears against the retaining rod 12.

When the roll 15b has just been placed in position, its free marginal portion or edge may be in any position on its periphery and the user, or the official in charge of the apparatus, acts on the lever 25 and produces through the gear train 24 a continuous rotation of the rear cylinder 2b. As the roll 15b bears on the latter, it is driven in rotation until its free marginal portion comes in contact with the cylinder 2b which then directs it towards the nip line or gap 4 in which it then becomes inserted. As the front cylinder 2a is applied under the effect of its weight against the cylinder 2b, it is then driven in rotation in the opposite direction and this double movement of the two cylinders nips or grips and continuously unwinds the band 30 from roll 15b.

The apparatus is then in the "ready for use" position and, when the first user shifts again the actuating lever 25 through an angular travel of for example a maximum of 45°, the cylinders 2a and 2b effect three complete rotations and thereby drive the band 30 continuously to an extent of, for example, less than 40 cm and thus form a first band section which hangs below the apparatus and which the user can then tear off along the edge of the saw 22.

It will be understood that if, instead of comprising a continuous non-predivided band, the roll 15b comprised a band predivided into sections of 40 cms a portion of the same length would be dispensed by the two cylinders 2a and 2b and the user would be able to detach a section merely by tearing the band along the tear line provided for this purpose with no need to use the saw 22.

As the roll 15b is being used, the diameter of the latter gradually decreases until there remains on the mandrel 16b only a last section 30a, which, as seen in Fig. 4, is engaged between the two cylinders 2a and 2b. In this position, the mandrel 16b bears on the rod 11 and on the rear cylinder 2b.

A further action on the actuating lever 25 exerts, owing to the nipping action of the two cylinders 2a and 2b, a pull on the last section 30a adhered to the mandrel and this pulls the latter downwardly (Fig. 5). This downward movement

swings the movable unit carrying the cylinder 2a outwardly of the case. Thus the descent of the mandrel is combined with a practically instantaneous dropping of the reserve roll 15a

which is released by the withdrawal of the rod 12 brought about by the fact that the levers 8a, 8b are swung about the journals 7a, 7b by the rod 11 which was urged forwardly by the mandrel in the downward movement of the latter. Consequently, as a result of this combined movement of the descent of the mandrel and the dropping of the reserve roll, the latter both strikes the mandrel (which assists the mandrel in its downward movement) and stops it from rotating (which prevents it from rotating about itself without being drivable by the cylinders), this double action thus completing the expulsion of this mandrel between the two cylinders 2a and 2b.

It will be observed that this apparatus provides additional safety apart from the various advantages indicated in the beginning of this description. Indeed, if an ill-intentioned user raised the cylinder 2a (in the event that the casing did not completely surround the latter), the reserve roll 15a could not be released by the rod 12 so long as the roll 15b in use has not been completely used up. Indeed, the levers 8a and 8b cannot pivot (under the effect of a displacement of the rod 11) so long as the roll 15b has not been completely used up.

Even under these conditions, the ill-intentioned user cannot extract the whole of the remaining part of the roll because any pull exerted on the free marginal portion of this roll only results in a single rotation of the latter.

#### CLAIMS

1. An apparatus for dispensing sheet products supplied in the form of continuous bands in rolls on cylindrical supports, of the type comprising a case which at least a lower cavity in the lower part of which are located, on one hand, means defining an elongated and horizontal dispensing passage having a section roughly corresponding to the section of the sheet product and, on the other hand, within said lower part of the case, a bearing means movable in a direction perpendicular to the dispensing passage, wherein the bearing means is not accessible from outside the case and is disposed in the direction of the length of the dispensing passage in facing relation, in at least a part of its length, to a roll of product which is placed in said lower cavity so as to act as a support for said roller in a retaining position, said bearing means being, in said retaining position, located at a distance from one of two elongated members defining said passage which is less than the diameter of a cylindrical support, said bearing means being capable of being placed in a withdrawn position at a distance from said elongated member at least equal to said diameter, and the cylindrical supports of the rolls of product being each provided with a flexible seizing member fixed to the transverse wall of the support and means for returning the bearing means to the

bearing position thereof.

2. An apparatus according to claim 1, wherein the bearing means is laterally offset from a mean vertical plane of the dispensing passage to the side opposed to said elongated bearing member.

3. An apparatus according to claim 1 or 2, wherein the bearing means is distinct from the two elongated members which define the dispensing passage and one of said two elongated members is mounted to be freely movable in a direction perpendicular to said dispensing passage.

4. An apparatus according to claim 1, 2 or 3, wherein, in the case where the members defining the elongated passage are formed by two nipping members which are movable downwardly, one of said members constitutes the elongated bearing member.

5. An apparatus according to claim 4 when dependent from claim 3, wherein the nipping member which constitutes the movable elongated member is mounted to be maintained in the nipping position under the effect of its own weight.

6. An apparatus according to any one of the claims 1 to 5, wherein the flexible seizing member of the cylindrical support of the roll of product is formed by the last section of the product of the roll which is adhered to the cylindrical surface of said support.

7. An apparatus according to any one of the claims 1 to 6, wherein, in the case where the case also has an upper cavity disposed vertically above the first-mentioned cavity where there is provided between said two cavities a retaining means connected to said bearing means so as to be also movable between a retaining position and a withdrawn position, said retaining means is also disposed in the direction of the length of the dispensing passage in facing relation, in at least a part of the length thereof, to a roll of product placed in the upper cavity, said retaining means being, in the retaining position thereof, located at a distance from a fixed support member for the roll of the upper cavity which is less than a diameter of the roll of product and, in the withdrawn position thereof, located at a distance which exceeds the diameter of the roll of product.

8. An apparatus according to claim 7, wherein, in the case where the bearing means and the retaining means are disposed respectively adjacent the ends of two arms of a lever mounted on the case to pivot about a horizontal axis, the arm of the lever which carries the bearing means is shorter than the arm which carries the retaining means.

9. An apparatus according to any one of the claims 1 to 8, wherein two pivotal levers are provided which are interconnected by two horizontal elongated members in the form of a rod extending parallel to the direction of the dispensing passage and constituting the bearing means and the retaining means, said pivotal levers being disposed in the vicinity of the sides of the case perpendicular to said direction.

10. An apparatus according to claim 8 or 9, comprising a spring constituting said return means connected to the end of the arm of the pivotal lever which carries the retaining means.

11. An apparatus for dispensing sheet products, substantially as hereinbefore described with reference to and as shown in the accompanying drawings.