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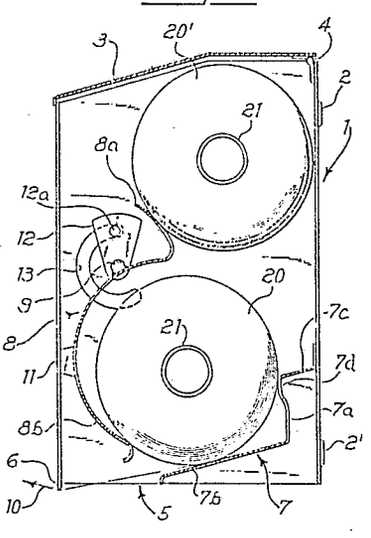
(54) **Rolled paper towel dispenser device, equipped with a spare roll.**

(57) A rolled paper towel dispensing device is described herein, provided with a spare roll adapted to be dropped, following a simple hand operation from outside, towards an operating position when the roll previously in use has been used up. The subject device includes, within a housing-body communicating with the outside only by means of a lower slot through which the paper strip is made available to the users close to a blade for severing the desired length of paper, a substantially unsymmetrical S-shaped member (8) fastened, at an area intermediate between the two portions (8a, 8b) of said S, to a pivot shaft (9) rotatably mounted on said housing (1) and connected to rotation driving means (12a, 32, 15) thereof, which rotations result in rotations of said S-shaped member (8). The smaller portion (8a) convex side provides support for the spare roll (20'), possibly in combination with other shaped member integral with the housing (1). When the S-shaped member (8) is rotated, it drops said roll (20') in the underlying area, wherein it is collected by the concave side of the larger portion (8b) which guides the roll (20') towards the operational unrolling area, cooperating with stationary guide means integral with the housing (1).

Fig. 2



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Description

ROLLED PAPER TOWEL DISPENSER DEVICE, EQUIPPED WITH A SPARE ROLL

This invention relates to a rolled paper towel dispenser device equipped with a spare roll.

Paper dispensers from a roll are already known which are adapted to supply paper portions of a predetermined or user-adjustable length, to be used as towels, tissues, and so on. Said devices are usually installed in lavatory areas for communities or social premises like coffee, shops, bars, restaurants, and so on, whereby paper usage is rather fast, and a problem which has constantly to be faced is the availability of a spare roll which can be readily replaced in order to avoid any out of service condition due to the device being out of paper. This involves that a spare roll is usually laid on said device, without any protection, whereby it can get wet, dirty or damaged in any way due to possible acts of vandalism by the users, who could also steal the roll. In addition, the replacing operation of a used roll with a new one normally is not so easy to be left to the user himself but requires help from authorized personnel being in charge of a key to open the device which is normally locked.

It has now been devised, and it is the object of the present invention, a device normally holding two paper rolls, wherein one of the rolls, lying on the bottom of the device, close to the dispensing slot, is available for unrolling and tearing the paper. Said operations are a consequence of the downward and forward pulling action performed by the user, followed by an upward action for the tearing of the required length of paper against a stationary blade provided on the front part of the lower side of the device. The second roll, i.e. the spare roll, is located in an upper position, whereby it can replace the lower one in the operating position when the latter has been used up, following a simple hand operation performed by the user himself. Both rolls will be of the cardboard core type.

According to the above, there is provided a dispenser device having a larger range of supply, higher service continuity and less maintenance problems, in that a spot checking will be enough to replace the spare roll when the latter is already being used. In fact it is possible to simply insert the new roll through the top of the device after having opened a top lid thereof. A better grip of the paper by the user is also provided in that the user is simply required to pull on the edge protruding freely out of the dispensing slot.

These and other advantages are provided by a paper towel dispensing device using carboard core paper rolls and including a housing-casing having an upper cover and a lower dispensing slot located at the position of a stationary blade on the front wall of said device, characterized in that it includes an internal substantially asymmetrical S-shaped cam member which is fastened, at a location intermediate the two loops of the S shape, to a pivot shaft rotatably mounted on said housing and connected to hand-operated rotation driving means, stationary guide means being also provided integral with the lower part of the housing, and adapted to cooperate with the concave side of the larger loop of said S-shaped cam member to keep a first roll in an unrolling position close to the dispensing slot, while a second spare roll is positioned on the convex side of the smaller loop of said S-shaped cam member.

According to a particular feature of this invention, when the lower roll has been used up, the core thereof may be allowed to fall through the dispensing slot in order to free the lower part of the cam member which, being acted upon by said hand-operated driving means, can rotate to a position where the upper roll is no longer supported and it falls by gravity down to the position of use or unrolling from the concave side of the larger loop of the cam member, together with said lower guide means.

Further stationary guide and support means may possibly be provided for the upper spare roll, associated with the upper part of the S-shaped cam member, and integral with the housing, and abutment means can also be provided integral with the front convex portion of the cam member, corresponding to the larger loop, to stop the rotation of the latter at a predetermined distance apart from the front wall of the device.

Further objects, advantages and features of the dispensing device according to this invention will be apparent to those skilled in the art from the following detailed description of some preferred embodiments thereof, described herein for exemplary and non limiting purposes and referring to the attached drawing, wherein:

Figure 1 is a schematic front view, partially broken away, of the dispenser device according to this invention;

Figures 2, 3 and 4 show a sectional view of said device along line II-II of Figure 1, respectively in normal operating conditions with the dispensing roll almost full, in another operating condition wherein said dispensing roll has been used up, before replacing, and while it is being replaced, when the spare roll is allowed to fall into the dispensing position;

Figure 5 is a front view of the device, partially broken away, showing another embodiment of the S-shaped cam rotation driving means;

Figure 6 is a side view of the device along section line VI-VI of Figure 5;

Figure 7 is a front view, partially broken away, of a further embodiment of the S-shaped cam rotation driving means;

Figure 8 is a side sectional view of the means shown in Figure 7; and

Figure 9 is a highly schematic view which has been attached only to show a different positioning of said S-shaped cam member.

Referring now in particular to Figures 1 to 4, the dispensing device according to this invention includes a housing-casing 1, preferably of a plastic material endowing a certain mechanical strength, possibly provided with known means 2, 2′ on the

back side for fastening to a support wall. On the upper part of casing 1 there is provided a lid 3 pivoted at 4 on the back wall.

The lower side of the device is provided with a dispensing slot 5 defined by a shaped wall member 7 integral with the back wall, and a saw-like blade 6 integral with the device front wall. Through said dispensing slot 5 the free edge of the paper 10 can be pulled towards the outside and, after having been pushed upwards, it can be easily cut by the user to the desired length, by forcing it against stationary blade 6.

According to this invention, inside casing 1 there is mounted a member 8, whose width is slightly smaller than the distance between the side walls, and having a non-symmetrical S shape, with two portions 8a and 8b whose size and curvature are different. In an area intermediate between said two portions, member 8 is fastened to a horizontal pivot shaft 9, parallel to the axes of two paper rolls 20, 20′ which rolls are stiffened by a conventional core 21 and are contained in the device, said pivot shaft being rotatably supported, at both their ends, by support means integral with both side walls of the device.

Pivot shaft 9, in particular at one end thereof, bears associated therewith rotation operating means in order to cause a corresponding rotation of member 8 when the unrolling paper roll has been used up and spare roll 20′ has to be brought to the dispensing area.

Said rotation operating means, in the embodiment shown herein, are located inside housing 1 and in particular they comprise a plastic material sector member 12, having a substantially trapezoidal shape with curved opposite bases, wherein at the wider base there is provided an opening 12a adapted for insertion of a user's finger in order to rotate sector member 12.

Sector member 12 is located close to a contacting position relative to the inner surface of housing 1, as it can be seen in particular from Figure 1 and, on said wall, there is provided a curved slot 13 having a substantially semicircular shape, which allows sector member 12 to be operated, a first time, through a rotation according to arrow L when spare roll 20′ has to be brought from the position of spare shown at Figures 1, 2 and 3, to the dispensing position shown with a chain line in Figure 4.

When the rotation according to arrow L ends, spare roll 20′ is received in portion 8b of member 8 (Figure 4) and, in order to bring said roll 20′ to the dispensing position, it is only necessary to operate sector member 12 through a rotation opposite to the previous one, whereby member 8 is brought back to the starting position shown in chain lines at Figure 4.

Still referring to the above mentioned Figures, S-shaped member 8 normally has smaller portion 8a thereof above pivot shaft 9, with the concave side thereof facing towards the device front wall, while larger portion 8b is located below pivot shaft 9 with the convex side thereof facing towards the device front wall wherefrom it is kept spaced apart by means of a spacer member 11 integral with said wall 8b. During normal operation, as shown in Figure 2, in a condition where roll 20 has just begun being used and the diameter thereof is close to the full one, said roll leans on one side against the lower end portion of portion 8b and on the opposite side against stationary shaped wall member 7, and in particular against downward sloping portion 7b thereof, whereby it is always located close to dispensing slot 5 until the paper has been completely used up, as it is shown in Figure 3.

In said conditions, the user unrolls paper 10 from roll 20, while in the device upper portion, second roll 20′ which has been inserted into the device by opening lid 3, waits in a spare position being supported between the back wall of housing 1 and portion 8a of member 8. A possible unintentional or intentional operation of sector member 12 is prevented by roll 20 pushing against vertical wall 7a of the shaped wall member 7 or, in any case, all the way to small diameters of roll 20, by the resistance of said roll to be displaced in particular through counterclockwise rotations of the lower edge of member 8.

When the diameter has been reduced to the point where it is substantially equal to that of core 21, as it is shown in Figure 3, said core is manually withdrawn from housing 1.

According to a further feature of the concerned device, as it is shown in Figures 2 to 4, vertical section 7a of shaped wall member 7 is provided with an upper convex portion 7d preventing core 21 from moving upwards as it might happen in case of an unintentional and violent action exerted on member 8. In such a case the risk would be that core 21 goes to position itself inside portion 8b of member 8 thereby severely hindering the operation of bringing spare roll 20′ to the dispensing position. This would even jeopardize the whole dispenser operation in that, as it is apparent, core 21 in such a position would prevent roll 20′, from assuming a correct dispensing position and, at the same time, it would prevent said roll from rotating.

In fact, as it is apparent from Figure 3, also in a case of violent operation of member 8, core 21 ends up in the position shown in dashed line, in the region where side 7b of shaped wall member 7 converges with side 7a coming down from portion 7d.

Now if sector member 12 is operated through a counterclockwise rotation (arrow L of Figure 4), in order to overcome the last remaining obstacle which is the force exerted on portion 8a by the weight of spare roll 20′, upper portion 8a is first moved back, as it is shown by full lines in Figure 4, whereby roll 20′ does not find a sufficient support any longer and drops by gravity until it meets the concave portion of portion 8b whose radius of curvature is chosen in such a way as to coincide, at least in part, with that of a new roll to be used. If sector member 12 is eventually brought to the starting position thereof, member 8 and roll 20′ get to the position shown in chain line in Figure 4, corresponding substantially to the position of Figure 2 for the previous roll which has been used up. At this point, a new spare roll can be inserted through the top to ensure a satisfactory operating range for the device.

It should be noted that shaped wall member 7,

besides vertical section 7a and downward sloping part 7b, is further provided with a second upper part 7c, which is sloping down as well, which reduces the impact of falling roll 20′ and guides it in a better way towards the operational position thereof, close to dispensing slot 5. It should also be noted that other shaped members may be provided (although not shown in the drawing) in the upper inside region of the device, to cooperate with portion 8a in supporting roll 20′ in a spare position.

In any case, it is required that said optional shaped members do not interfere with said roll in the downward falling trajectory thereof, during replacement.

Referring now more particularly to Figures 5 and 6, there is described another embodiment of the rotation driving means acting on pivot shaft 9, while the features and functions of S-shaped member 8 and of shaped wall member 7 remain the same.

According to this embodiment, said driving means comprise a suitably shaped plate 30 which is integrally fastened at a lower portion and at a vertical side thereof, with a part of the upper end of portion 8b, and to portion 8a, respectively. The fastening of plate 30 to the areas of member 8 mentioned above may be obtained in any know way.

Plate 30 is provided, close to the end of portion 8a, with a recess 32 which can be reached by the user through a slot 34, having a function similar to slot 13 of the first embodiment of the driving means.

Having provided recess 32 instead of a through opening 30 is only for safety reasons but, as it is apparent, in this case as well a through opening can instead be provided on plate 30.

Concerning the operation of member 8 by means of plate 30, what has been described above referring to sector member 12 is still substantially applicable.

Referring now more particularly to Figures 7 and 8, a further embodiment will now be described for pivot shaft 9 driving means, while the features and function of unsymmetrical S shaped member 8 and of shaped wall member 7 remain unchanged.

In the embodiment shown in Figures 7 and 8, the driving means comprise a substantially L-shaped lever 15 which, as it is apparent in particular from Figure 7, is fastened at one end thereof to a central position of portion 8a of member 8, immediately below pivot shaft 9. Operating lever 15 is mounted in such a way that an arm 17 thereof lies substantially at right angles to the front face of housing 1 protruding out of the latter through an opening 18a provided through a recessed portion 18 of said front face. Inside recessed portion 18 there is provided a second arm 16 of operating lever 15, the latter arm extending vertically to a height which leaves a limited room between the free end of said lever and the top side of said recessed portion 18. In this way a user can insert his hand and make lever 15 to rotate counterclockwise according to the direction of arrow H of Figure 8, to make spare roll 20′ to fall when roll 20 has been used up. The operation of the dispensing device provided with the driving means just described is exactly the same as for the previous embodiments wherein said means were comprised of sector member 12 or plate 30.

In Figure 9 there is shown a further embodiment of the dispensing device according to this invention, which can identically include, as pivot shaft 9 rotation driving means, and thereby member 8 rotation driving means, sector member 12, plate 30 or operating lever 15. In this respect Figure 9 is absolutely schematic, and it has been reported only to show how unsymmetrical S-shaped member 8 may also be located at the back wall of housing 1. In fact, in Figure 9 member 8 is now located on the right instead of on the left, in a perfectly symmetrical position relative to the one shown in Figures 1 through 8.

From Figure 9 it may also be noticed that shaped wall member 7 as well is located in a symmetrical position relative to the one it had in Figures 1 through 8, whereby dispensing slot 5 is now slightly set back compared to the preceding version of the dispensing device. In any case, the operation of this embodiment is perfectly identical to that of the previous ones.

However, in the latter case it is possible to obtain a further advantage of providing a transparent front wall to housing 1, whereby the available amount of paper can be seen from outside and it is possible to judge when to transfer roll 20′ to the dispensing area and to insert a new roll as a replacement thereof.

Concerning the mechanical strength properties of member 8, the latter can be made according to two versions, both of which are advantageous.

According to a first embodiment, member 8 is made completely stiff by providing uniformly spaced stiffening ribs on the surface thereof which never comes into contact with paper rolls 20, 20′. Therefore, the ribbed surface will be the concave side of portion 8a and the convex side of portion 8b.

The embodiment of member 8 just described provides a long service life of this member, considering the fact that it is used by the public and therefore it is subjected to varying degrees of stress according to the user, the stress being often non disregardable.

According to a second embodiment of member 8, the upper part thereof is stiff, while the lower end of portion 8b, which comes into contact with roll 20 in a dispensing position is made in such a way as to provide a certain flexibility whereby it can yield to a certain degree.

The latter embodiment improves the paper unrolling conditions and the rotation of roll 20, providing also for an easier withdrawal of core 21 when it has to be taken out of the dispensing device.

Possible additions and/or modifications can be made by those skilled in this art to the embodiments of the dispensing apparatus according to this invention described herein above and shown in the annexed drawings without exceeding the scope of the invention. In particular the housing-casing of the device can be of any suitable body design, and the guide shapes integral therewith may possibly be directly comprised of suitably shaped parts of the body itself.

A further modification which has to be considered as an equivalent solution may be the one where sector member 12 is mounted outside housing 1,

received in a suitable recess of said housing, as it has already been provided for the vertical leg of operation lever 15.

Claims

1. A dispenser device for paper towels from a roll having a cardboard core (21), with a spare roll, comprising a housing-casing (1) having an upper lid (3) and a lower dispenser slot (5) at the location of a stationary blade (6), characterized in that it includes an internal member (8) having a substantially unsymmetrical S-shape, which is fastened, in an intermediate region between two portions (8a, 8b) of the S, to a pivot shaft (9) rotatably mounted on housing (1) and connected to manually actuated driving means (12, 30, 15) for the rotation thereof, stationary guide means (7) being also provided, which are integral with the lower portion of housing (1), adapted to cooperate with the concave side of said larger portion (8b) of said member (8) in order to keep in an unrolling position a paper roll (20) close to dispensing slot (5), the spare roll (20'), when positioned on the convex side of smaller portion (8a) of said member (8), leaning at the same time against one of the vertical walls of housing (1).

2. The device according to Claim 1, characterized in that said S-shaped member (8), in normal operating conditions, and while the operating means (12, 30, 15) which provide for rotation of pivot shaft (9) are not operated, has the smaller portion (8a) thereof located above pivot shaft (9) with the concave side thereof facing the front wall of the device, and the larger portion (8b) below pivot shaft (9) with the convex side thereof facing the front wall of the device, the distance of the innermost portion of said portion (8a) from the back wall of the device being smaller than the diameter of a new roll (20, 20') not yet in use.

3. The device according to Claim 1, characterized in that said S-shaped member (8) in normal operating conditions, while pivot shaft (9) rotation driving means (12, 30, 15) are not actuated, has the smaller portion (8a) thereof located above pivot shaft (9) with the concave side thereof facing the back wall of the device, and the larger portion (8b) thereof located below pivot shaft (9) with the convex side thereof facing the back wall of the device, the distance between the innermost area of said portion (8a) and the front wall of the device being smaller than the diameter of a new roll (20, 20') not yet in use.

4. The device according to Claim 1, characterized in that said stationary shaped guide means (7) are located in the lower area of the back wall of housing (1).

5. The device according to Claim 1, characterized in that said stationary guide means (7) are located in the lower area of housing (1) front wall.

6. The device of Claim 1, characterized in that said stationary guide means (7) comprise a shaped member having at least a vertical part (7a) located at a predetermined distance apart from one of housing (1) vertical walls, and a sloping flat surface (7b) adapted to guide roll (20) towards said dispensing slot (5), whereat said roll is positioned by the lower end of said portion (8b) of member (8).

7. The device of Claim 6, characterized in that said shaped guide means (7) further comprises a second sloping upper guide portion (7c), adapted to cooperate with said portion (8a) for guiding spare roll (20') to the dispensing position.

8. The device of Claim 1, characterized in that said pivot shaft (9) rotation driving means comprise a substantially trapezoidal sector member located within housing (1) and fastened at one end thereof to the end of pivot shaft (9) inside housing (1), while at the opposite end said sector (12) has an opening (12a) accessible to the user through a substantially semicircular slot (13) cut through the opposite wall of housing (1).

9. The device of Claim 8, characterized in that said sector (12) is mounted outside housing (1) and inside a recess of housing (1) side wall.

10. The device of Claim 1, characterized in that pivot shaft (9) rotation driving means comprise a shaped plate (30) integral with member (8) upper part, in particular with portion (8b) upper part and with the whole upper portion (8a), said plate (30) being provided with a recess (32) facing towards the inside of housing (1), which is accessible to the user through a slot (34) cut through a housing (1) side wall and extending along an arc of a circle.

11. The device of Claim 1, characterized in that said pivot shaft (9) rotation driving means comprise a substantially L-shaped lever (15), having an arm (17) thereof fastened to member (8) immediately below pivot shaft (9) and protruding outside housing (1) through an opening (18a) provided in a recess of housing (1) wherein a second substantially vertical arm (16) of operating lever (15) is located.

12. The device of Claim 11, characterized in that operating lever (15) is located in a substantially central position relative to pivot shaft (9).

13. The device of Claim 6, characterized in that shaped member (7), at the upper end of vertical portion (7a) thereof is provided with a convex portion (7d) adapted to prevent core (21) of a used up roll to move upwards when member (8) is rotated to receive spare roll (20').

14. The device of Claim 1, characterized in that asymmetric S-shaped member (8) is completely stiff.

15. The device of Claim 1, characterized in that asymmetric S-shaped member (8) is partially stiff, but it can resiliently yield at portion (8b)

lower end, i.e. at the part thereof in contact with the dispensing roll.

Fig.1

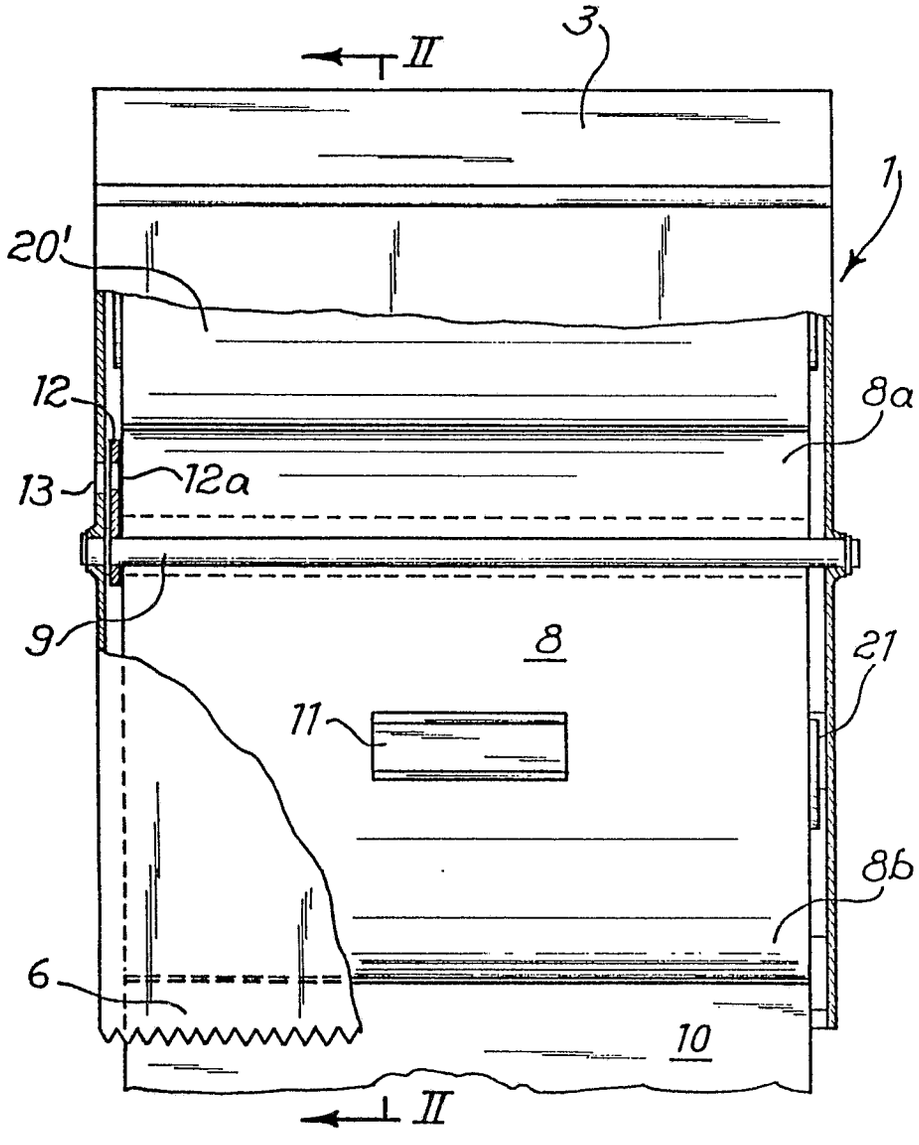

Fig.2

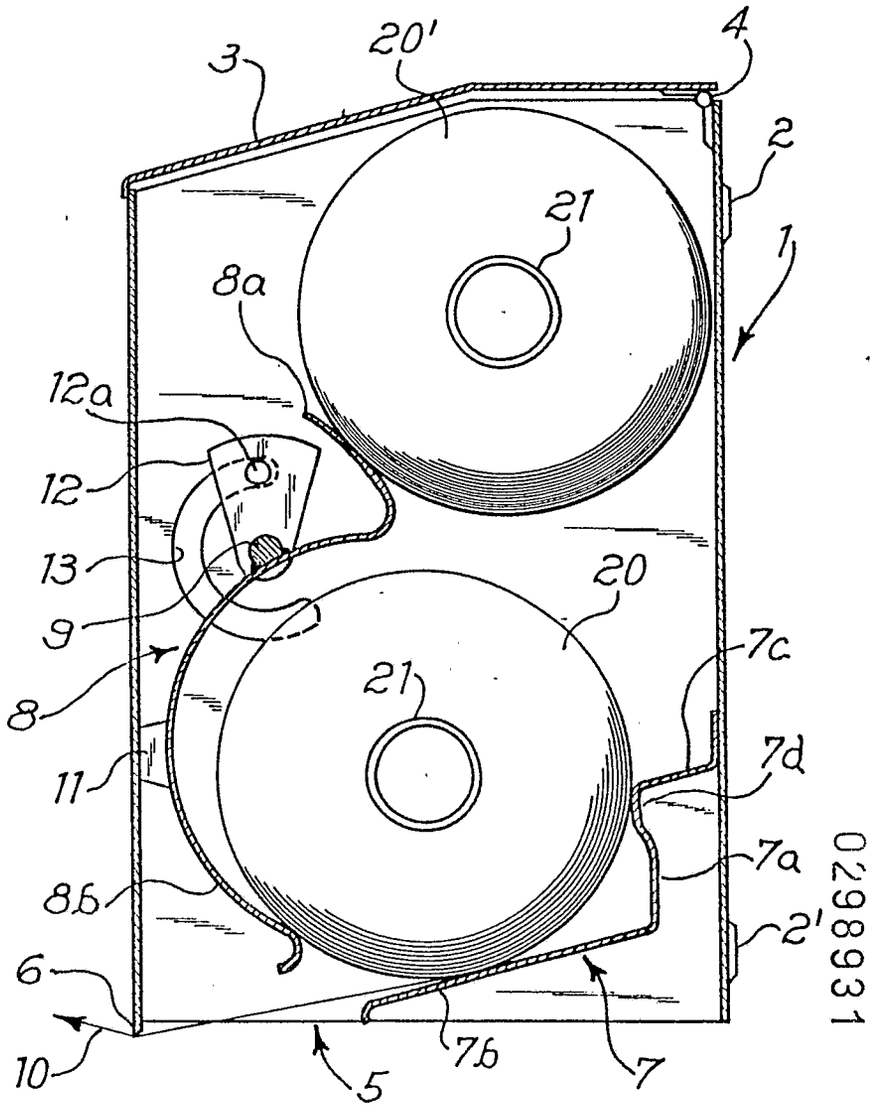

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Fig.4

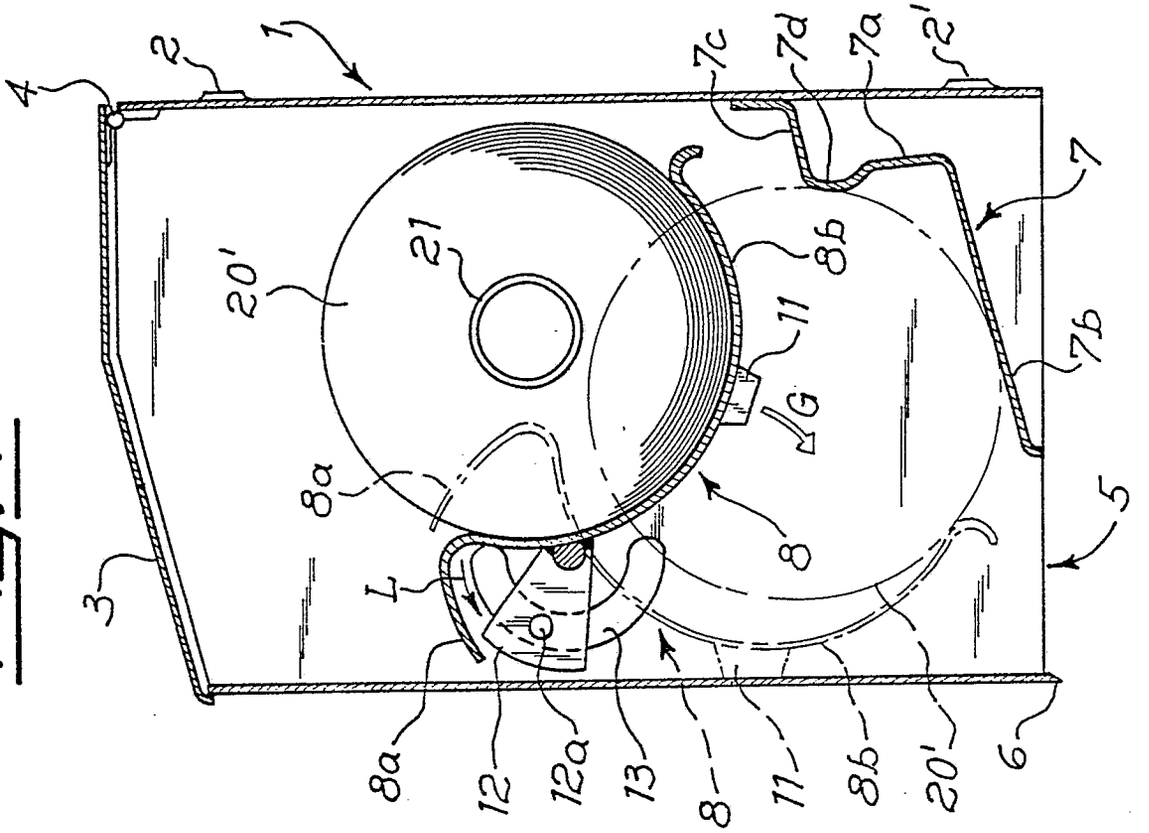
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Fig.3

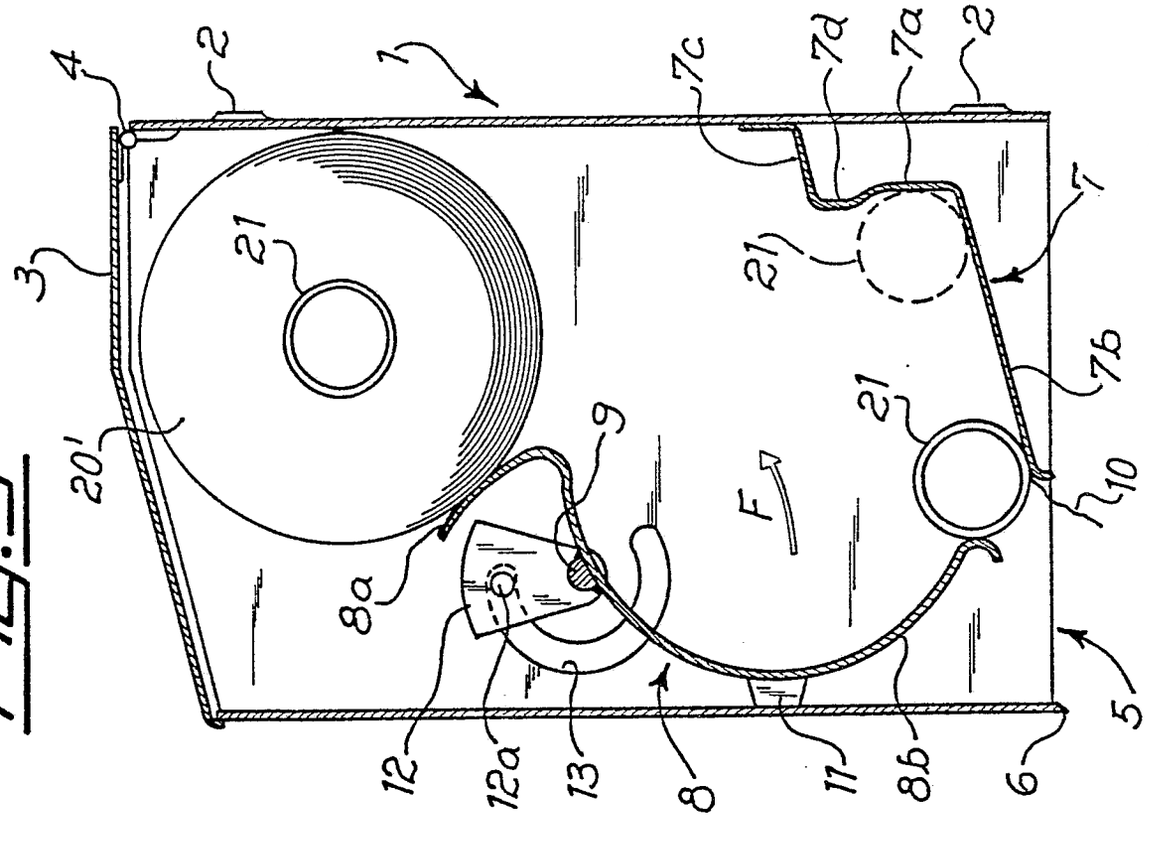
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Fig.5

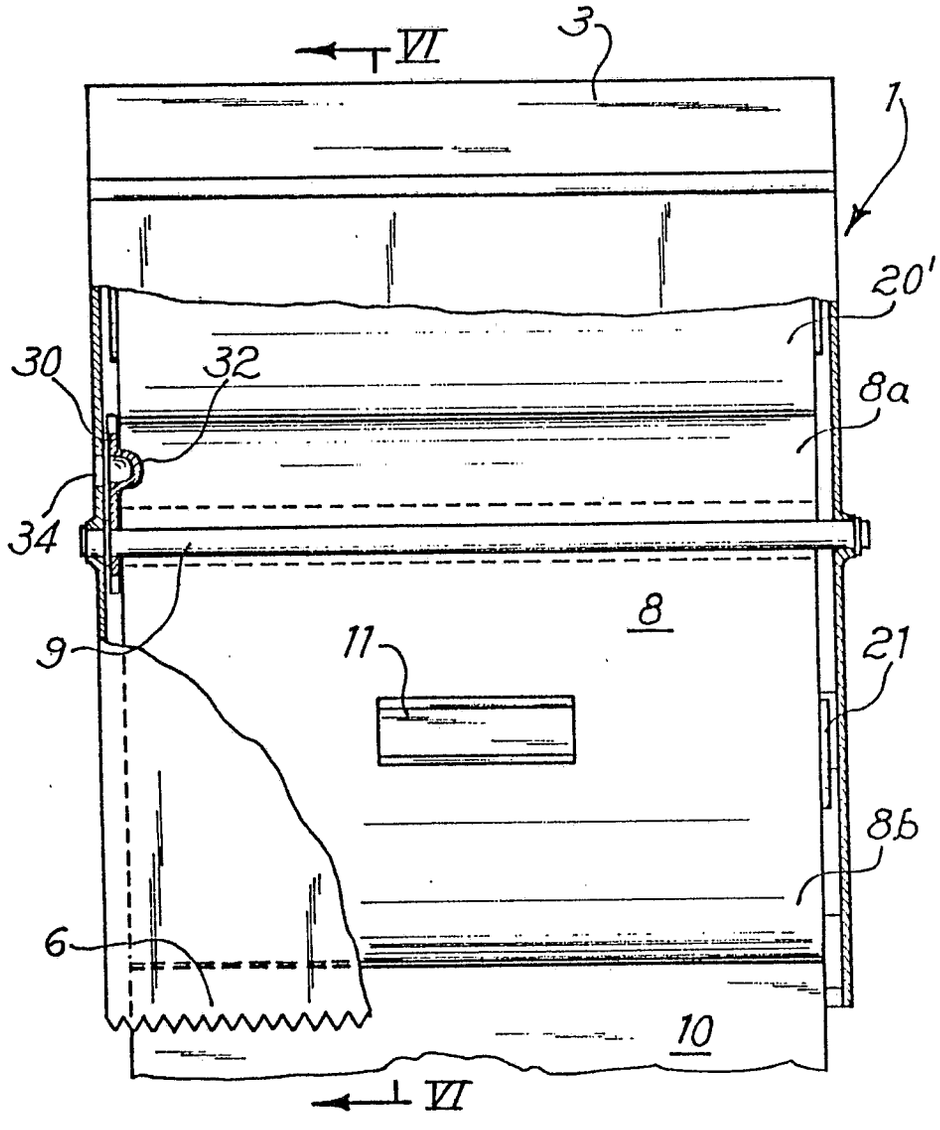
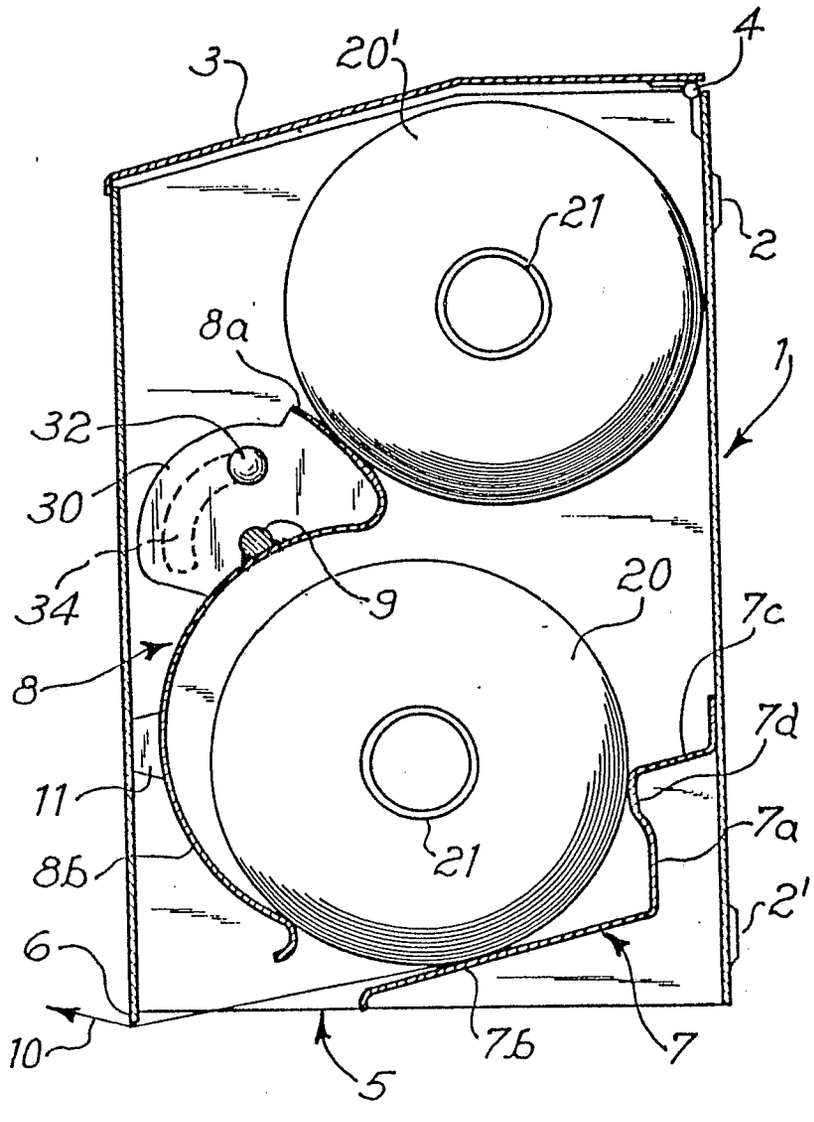


Fig.6



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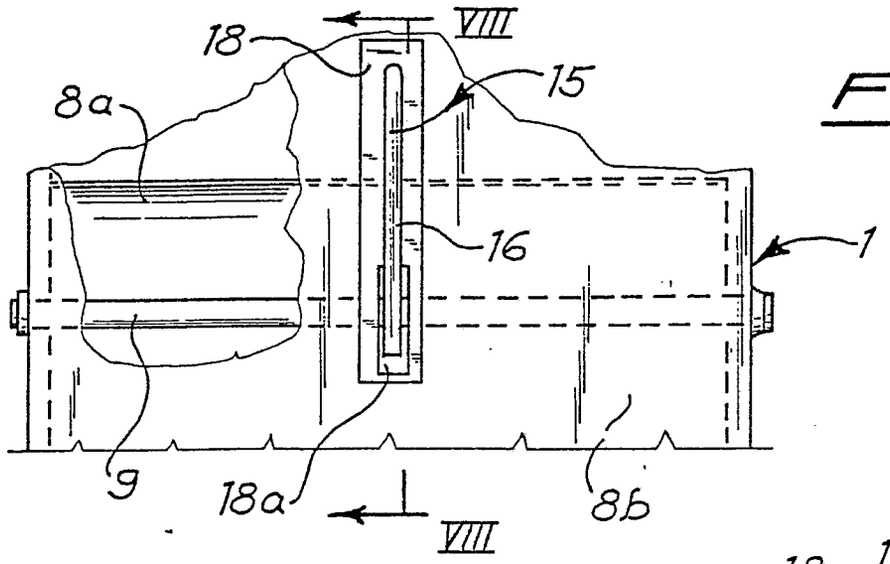

Fig.7

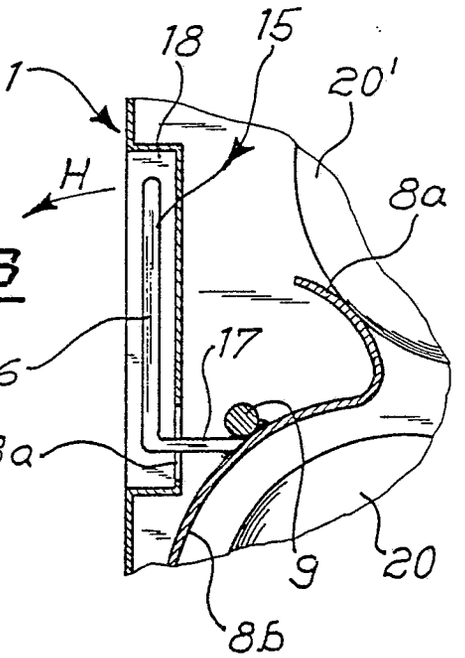

Fig.8

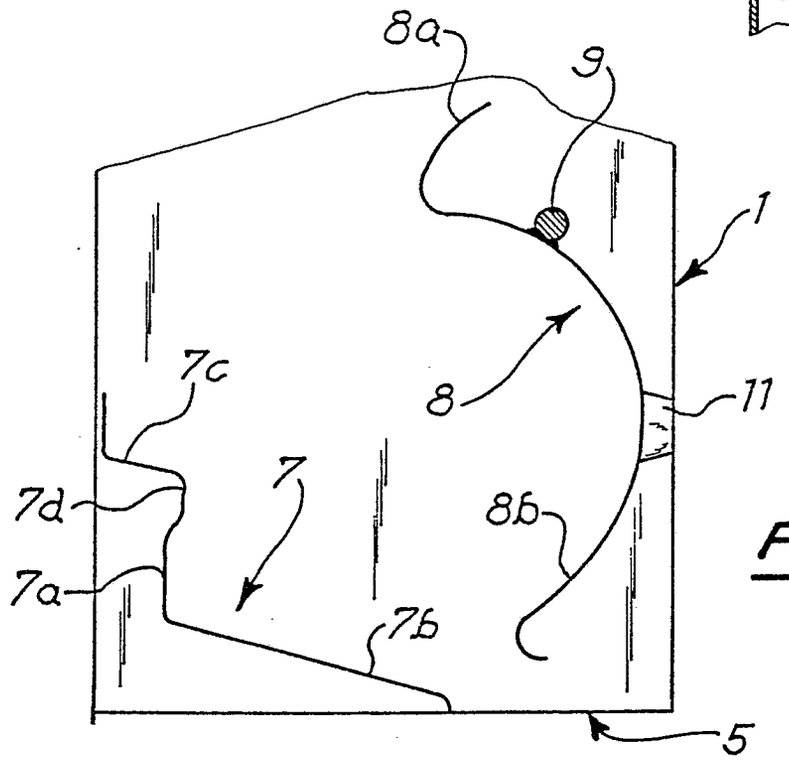

Fig.9

European Patent Office

EUROPEAN SEARCH REPORT

Application number

EP 88830290.8

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)
A	DE - A - 1 907 716 (TIJGER PLASTICS) * Fig. 2,3 * --	1	A 47 K 10/38
A	GB - A - 2 193 947 (VITO IMPEX) * Fig. 2 * ----	1	

TECHNICAL FIELDS SEARCHED (Int. Cl.4)

A 47 K 10/00

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
VIENNA	05-10-1988	KNAUER

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
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P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
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& : member of the same patent family, corresponding document

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