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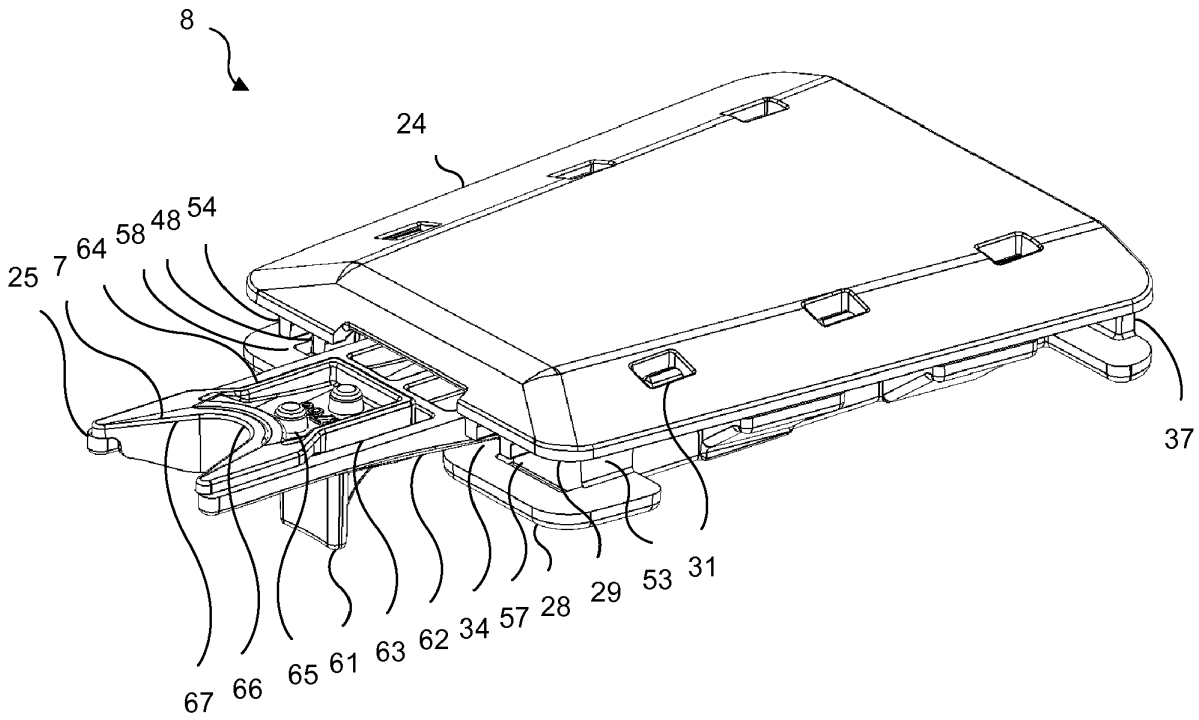
(54) **SHEETS DISPENSER WITH REMOVABLE RESTRICTION COMPONENT**

(57) A sheets dispenser comprising a container with an exit port, in which said exit port comprises an opening partly defined by an edge of a static panel of said dispenser and partly defined by a leading surface of a restriction component, and in which said restriction component is removably mounted in said dispenser with a rear surface thereof level with a plane of an external surface of said dispenser.

Figure 1



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Description

[0001] The present invention relates to a sheets dispenser with a removable restriction component, for use particularly, but not exclusively, to dispense individual paper towels from a roll of paper.

[0002] Paper towels are commonly dispensed from so-called centrepull paper dispensers, which allow users to pull paper towels from a central exit port on an underside thereof. The paper for such dispensers is provided in the form of a web of paper arranged into a roll, and the action of pulling paper from the exit port allows for, or facilitates, its separation into individual paper towels. The roll of paper is arranged on its end on a platform inside the dispenser, and the web of paper is drawn from the inside of the roll through an aperture in the platform and then out through the exit port. In an older generation of centrepull paper dispensers the exit port comprises a tapering cutting indentation against which the user can jam the web of paper in order to tear off a section. This arrangement is necessary when the web of paper is a continuous sheet without any lines of perforation formed in it. A major problem with this kind of arrangement is the wastage of paper, because users tend to draw out too much.

[0003] In order to address this problem it is now common to provide the web of paper with lines of perforation, and to replace the tapering indentation with a small exit port through which the web of paper has to be drawn. The small exit port restricts the flow of the web of paper, and in particular the force required to pull it through the exit port is greater than the force required to separate a piece along a line of perforation. Therefore, when a user draws down on the web of paper it passes through the exit port until a line of perforation has emerged, at which point the web of paper tears and the user is left with a single paper towel. A short section of the web of paper is left protruding from the exit port for the next action. With this arrangement users only obtain a pre-determined size of paper towel each time, which significantly reduces wastage.

[0004] However, one particular problem with these kinds of centrepull paper dispensers is that the paper used can vary in weight. This can happen to such an extent that the restriction provided by the exit port can be too great, and the paper cannot be removed therefrom, or it can be too small, in which case the web of paper does not separate along its lines of perforation.

[0005] Another issue is that there are a large number of the older generation of centrepull dispensers in existence which do not comprise a restrictive exit port, and therefore do not work in the efficient manner of the newer generation. It can be very expensive for large organisations to replace all their existing dispensers with new ones with a newer technology.

[0006] Yet another issue is that the exit port variety of centrepull paper dispensers are generally more complex in design than the older generation. For example, they may have moving parts which control the size of the exit port, as well as associated complexities for accommodating such features. Any design which can eliminate some of this complexity would be advantageous.

[0007] The present invention is intended to overcome some of the above described problems.

[0008] Therefore, according to a first aspect of the present invention a sheets dispenser comprises a container with an exit port, in which said exit port comprises an opening partly defined by an edge of a static panel of said dispenser and partly defined by a leading surface of a restriction component, and in which said restriction component is removably mounted in said dispenser with a rear surface thereof level with a plane of an external surface of said dispenser.

[0009] Thus, the present invention provides a centrepull paper dispenser with a restriction component removably mounted therein. This allows for a modular approach, with the same main dispenser parts being used for a simplex centrepull paper dispenser product without any restriction feature, as well as for an enhanced version featuring such a function. Furthermore, it is also possible to retro-fit the restriction component to existing products, and such a device forms the second aspect of the present invention, explained in greater detail below.

[0010] The restriction component can be retained in the dispenser with any suitable retention mechanism, such as a snap-fit arrangement or the like. However, in order to keep the number of additional complexities to a minimum, preferably the restriction component can be freely removably mounted in the dispenser, such that pressure applied to the leading surface in use biases the restriction component in an outward direction from the dispenser. Obviously the restriction function is not going to work if the restriction component actually moves in an outward direction from the dispenser, so the solution here is to utilise another surface to retain the restriction component in the dispenser, and in particular the wall to which the dispenser is mounted. Therefore the restriction component is captured between the dispenser and the wall, removing the requirement for any retention features.

[0011] It will be appreciated that the restriction component can be something as simple as a single moulded part with the leading surface at one end and the rear surface at the other. However, in a preferred construction the restriction component can comprises a spring loaded restriction member mounted for displacement in a housing. The restriction member can comprise the leading surface at an outer end thereof, and it can be biased into a first position in which the opening is a first size, and then be displaceable along an axis against the spring loading to increase the size of the opening. The housing can comprise a rear wall substantially normal to the axis which has the rear surface as an external side thereof.

[0012] The spring loading allows the size of the exit port to be adjusted to suit the weight of paper being used. In particular, if the leading surface is static, which is to say its position cannot be adjusted once the restriction component is fitted into the dispenser, then the exit port

opening has a fixed size. This will be appropriate for applying the necessary level of restriction to paper of a certain weight, and with a certain strength of perforation. However, in practice the papers which are used come from different suppliers and can vary considerably in their weight and strength of perforation. This can result in the restriction being too great, in which case it can be too hard to pull the paper from the dispenser and/or it separates along a line of perforation too soon, or the restriction can be too little, in which case the paper will not separate along a line of perforation. The axial spring loading of the restriction member addresses these issues by allowing the opening to increase to cope with papers of a heavier weight. In addition, the spring loading leads to a smoother operation for the user, because the opening increases and decreases in size to accommodate changes in the size and shape of the web of paper as it is drawn therethrough. The web of paper is significantly compressed as it passes through the opening, and it can do so irregularly. As such, the force required to draw it through the opening is not linear. However, the spring loading of the restriction member accommodates these irregularities to an extent by providing a dampening effect. The spring loading also leads to a more regular degree of restrictive force being applied to the web of paper, which improves this function and ensures that the separation action occurs correctly each time.

[0013] The spring loading also provides another advantageous feature, which is that the size of the opening can be manually increased to allow the end of the web of paper to be more easily threaded therethrough prior to use. It also allows for the opening to be manually increased to allow users to draw out a long length of paper without separating it along any lines of perforation. This might be done if a lot of paper is needed at once.

[0014] The dispenser can comprise a base and cover, with the cover being movable from a first position in which it is attached to a front of the base to form the container, and a second position in which it is displaced from the base to expose a storage compartment. The external surface, which the rear wall of the housing is level with, can then be a rear surface of the base. Therefore, the housing can be located in a dock provided in the rear surface of the base, before the base is then mounted on a wall to retain it therein. The manner in which the cover is moved between the first position and the second position can be any of the known ways, including full removal, or movement on a hinge at the top, side or bottom which connects the cover to the base.

[0015] In other respects the dispenser can be like known centrepull paper dispensers. Namely the storage compartment can comprise a platform for supporting a roll of paper with which the sheets dispenser is used, which has an aperture through which the web of paper can be drawn from the inside of the roll. The exit port can then be disposed below the platform, and the aperture and the opening can be aligned on a dispensing axis. This is a generally known configuration, and sees the web of paper extend from the inside of the roll, through the aperture and then down through the opening. As described above, the restriction function provided by the restriction member is applied to the web of paper as it passes through the opening, namely the force required to pull the web of paper through the opening is greater than that required to separate a section of the web of paper from the rest along a line of perforation.

[0016] The manner in which the restriction member is spring loaded along the axis can be any known spring mechanism, including a resilience integral to the restriction member itself, or it can be a spring such as a leaf spring or coil spring, which can be arranged for extension or compression when the restriction member is displaced from the first position. However, in a preferred arrangement the housing can comprise an internal chamber, an axial track provided inside the internal chamber and an aperture. The restriction member can then comprise a body mounted for axial movement along the track, and a neck portion which can extend through the aperture and which comprises the leading surface at an outer end thereof.

[0017] The track can comprise a pair of parallel rods arranged on either side of the axis, and the body can comprise a pair of ring members on either side thereof, each of which can be mounted for axial movement along one of the rods. This is an advantageous arrangement because it is stable in a lateral direction and the restriction member is prevented from twisting or laterally moving in use.

[0018] The spring loading can then comprise a pair of coil springs, each one mounted around one of the rods between an internal rearward surface of the internal chamber and the ring member mounted on that rod. This arrangement is advantageous because the pair of coil springs can share the work load in use, and because they are kept in line with the axis by the rods located inside them.

[0019] The internal chamber can comprise an internal forward surface, and the body can comprise stop members on either side thereof which each abut against a portion of the internal forward surface when the restriction member is in the first position. This structure delimits the forward position of the restriction member and prevents it from exiting the housing.

[0020] As referred to above, one advantage of the spring loading is that the size of the opening can be manually increased to facilitate the threading of the web of paper therethrough initially, and also to allow a long length of paper to be withdrawn without separating it along any lines of perforation. This might be done if a lot of paper is needed at once. Therefore, in one embodiment the restriction member can comprise a manual operation tab on an underside thereof. This allows easy manual manipulation of the restriction member.

[0021] As also referred to above, the papers which are used with dispensers like this can vary considerably in their weight and strength of perforation. While the spring

loading provides a degree of live adjustment to accommodate this, in some instances this may not be sufficient. Therefore, in one version of the invention the restriction component can comprise a removable head part at an outer end thereof, and the removable head part can comprise the leading surface. This construction allows for a head part of one size to be replaced with another, to accommodate thicker or thinner paper.

[0022] The leading surface can be any suitable shape appropriate for forming the opening. However, in a preferred construction the leading surface can be concave in a plane parallel with the axis. Likewise, the edge of the static panel can also be concave in the plane parallel with the axis. As such the opening comprises two areas formed by the concavities of the leading surface and the edge of the static panel.

[0023] The manner in which the housing is mounted in the base can be by means of any suitable known arrangement. However, preferably the housing tapers inwardly from the rear wall to a front wall thereof, and the rear surface of the base can comprise a dock with a tapering shape corresponding to that of the housing. This arrangement facilitates ready loading of the housing. It also allows the housing to be retro-fitted to existing centrepull paper dispensers which happen to have such a tapering shape already formed in the base part thereof. The applicant produces such a product, which is intended to be used with non-perforated paper, and which has a tapering cutting formation formed into the underside of the dispenser, against which the paper is forced by the user in order to tear it.

[0024] Further, the housing can comprise slots on opposite sides thereof, and the dock can comprise tabs on opposite sides thereof which are disposed in the slots when the housing is located in the dock. This arrangement provides a secure fitting for the housing. Once again, it also allows the housing to be retro-fitted to existing centrepull dispensers which happen to have such tabs, or structures which can perform that function. The applicant's product which has a tapering cutting formation comprises such structures, in the form of the peripheral parts of the cutting formation.

[0025] It will be appreciated from the above that the housing can be manufactured separately, for fitting to new dispensers during their manufacture, or for retro-fitting to existing dispensers. Therefore, according to a second aspect of the present invention a spring loaded restriction device for use in constructing a sheets dispenser as defined in any of claims 2-16 below is provided, in which said spring loaded restriction device comprises a housing and a spring loaded restriction member mounted for displacement therein, in which said restriction member comprises a leading surface at an outer end thereof, in which said restriction member is biased into a first position in which it can define an opening with an edge of a static panel of a sheets dispenser with which it is used, in which said restriction member is displaceable along an axis against said spring loading so as to increase the size of said opening, and in which said housing comprises a rear wall substantially normal to said axis.

[0026] Furthermore, it will also be appreciated that the housing, or a sheets dispenser, can be sold along with a number of differently shaped head parts to allow for different weights of paper to be used. Therefore, according to a third aspect of the present invention a kit of parts comprises a sheets dispenser as defined in claim 12 below, and one or more further removable head parts each shaped such that when mounted on said neck portion a leading surface thereof is disposed at a different distance from said outer end of said neck portion than said leading surface of said head component when it is mounted on said neck portion, as well as leading surfaces of each of said others of said further head components when they are mounted on said neck portion.

[0027] The invention can be performed in various ways, but one embodiment will now be described by way of example, and with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of a housing of a sheets dispenser according to the first aspects of the present invention;

Figure 2 is a perspective view of the housing shown in Figure 1 with an upper portion thereof removed;

Figure 3 is a perspective view of a sheets dispenser according to the first aspect of the present invention;

Figure 4 is a perspective view of the sheets dispenser shown in Figure 3 with a cover thereof removed;

Figure 5 is a rear view of the sheets dispenser as shown in Figure 3;

Figure 6 is a rear underside view of the sheets dispenser as shown in Figure 3;

Figure 7 is a top view of the sheets dispenser shown in Figure 3 with a cover thereof removed; and

Figure 8 is a rear view of the sheets dispenser shown in Figure 3 with a cover and a housing thereof removed.

[0028] As shown most clearly in Figure 6, a sheets dispenser 1 comprises a container 2 with an exit port 3. The exit port 3 comprises an opening 4 partly defined by an edge 5 of a static panel 6 of the dispenser 1 and partly defined by a leading surface 7 of a restriction component 8. The restriction component 8 is removably mounted in the dispenser 1 with a rear surface 9 thereof level with a plane of an external surface 10 of the dispenser 1.

[0029] Referring to Figures 3 and 4, the dispenser 1 is generally like known centrepull paper dispensers. Namely, it comprises a base 11 and cover 12, with the cover

12 being movable from a first position in which it is attached to a front 13 of the base 11 to form the container 2, as shown in Figure 3, and a second position in which it is displaced from the base 11 to expose a storage compartment 14. The cover 12 is attached to the base 11 by a hinge, the slots 15 for which are visible in Figure 4, and it rotates about this hinge in order to move from the first position as shown in Figure 3, to a position in which it is rotated through approximately 90 degrees to expose the storage compartment 14. The cover 12 is not shown in Figure 4. The storage compartment 14 comprises platform 16 for supporting a roll of paper (not shown) with which the dispenser 1 is used, which has an aperture 17 through which the web of paper can be drawn from the inside of the roll. The roll of paper is placed on its end on the platform 16, and the central core is removed. The web of paper is then drawn from the inside of the roll, and fed through the aperture 17.

[0030] The dispenser 1 is for mounting on a wall. Referring to Figures 5 and 6, a rear surface 18 of the base 11 is planar, and is provided with mounting holes 19, which facilitate its attachment to a suitable wall or fixed vertical surface. The dispenser 1 also has an underside 20, which is made up of a number of formations, one of which is the static panel 6. Referring to Figure 8, this most clearly shows that the static panel 6 comprises a tapering indentation 21 which extends inwardly from the rear surface 18. The original purpose of such a feature on known sheets dispensers is to serve as a tapering cutting formation against which non-perforated paper being dispensed can be jammed in order for the user to tear off a piece. It could still be used for this purpose if the restriction component 8 were removed from the dispenser 1. However, in a sheets dispenser of the present invention this formation serves a different primary purpose, namely it comprises a dock 22 in which the restriction component 8 is located, as explained in greater detail below.

[0031] As shown most clearly in Figure 8 the static panel 6 is situated below the platform 16. As such the exit port 3 (which not defined in Figure 8 as the restriction component 8 is not shown, but the position of exit port 3 is illustrated at 3a) is disposed below the aperture 17 on a dispensing axis A-A.

[0032] Referring to Figure 7, the opening 4 of the exit port 3 is defined by the edge 5 of the static panel 6 (which is the innermost part of the tapering indentation 21) and the leading surface 7. As these are both concave the opening 4 is generally annular. The purpose of the opening 4 is to restrict the passage of the web of paper, to such an extent that the force required to pull the web of paper through the opening 4 is greater than that required to separate a section of the web of paper from the rest along a line of perforation provided thereon. As such, when a user pulls on the web of paper extending from the opening 4 a section defined by a line of perforation is removed therefrom. Once a line of perforation has passed through the opening 4 it tears, and the section preceding it separates from the rest of the web of paper, thereby forming a paper towel for the user. As the web of paper is moving through the opening 4 when this happens, and as it takes a short period of time for the perforation to tear, a short section of the web of paper is left protruding from the opening 4 for the next user.

[0033] The restriction component 8 is shown in greater detail in Figures 1 and 2. It comprises a spring loaded restriction member 23 mounted for displacement in a housing 24. The restriction member 23 comprises the leading surface 7 at an outer end 25 thereof, and it is biased by coil springs 26 and 27 into a first position as shown in Figures 1 and 2, in which when the housing 24 is located in the dock 22 the opening 4 is a first size, as shown in Figure 7. As will be appreciated from Figure 2, the restriction member 23 is displaceable along axis B-B against the springs 26 and 27 to increase the size of the opening 4. It will be appreciated that not only does opening 4 increase in size due to this axial movement of the restriction member 23, but also because the width of the tapering indentation 21 increases in the direction of the rear surface 18 of the base 11. As the leading surface 7 moves back, the area of opening 4 defined by the leading surface 7 and the tapering indentation 21 increases in both length and width. This is explained in greater detail below.

[0034] The housing 24 comprises a lower portion 28 and an upper portion 29 which are a snap-fit together. In particular, the lower portion 28 comprises resilient latches 30 which locate on catches (not visible) provided in slots 31 formed in the upper portion 29. As shown in Figure 2 the lower portion 28 and upper portion 29 of the housing 24 define an internal chamber 32, an axial track, generally designated as 33, provided inside the internal chamber 32, and an aperture 34. The restriction member 23 comprises a body 35 mounted for axial movement along the track 32, and a neck portion 36 which extends through the aperture 34, and which comprises the leading surface 7 at the outer end 25 thereof. The housing 24 comprises a rear wall 37 (the lower half of which is visible in Figure 2) which is substantially normal to the axis B-B, and which has the rear surface 9 as an external side thereof. In other words, the external side of the rear wall 37 is level with the plane of the rear surface 18 of the dispenser 1 when the housing 24 is located in the dock 22.

[0035] The track 31 comprises a pair of parallel rods 38 and 39 arranged on either side of the axis B-B. Opposite ends 40 of the rods 38 and 39 are retained in sockets 41 created by the shapes of lower portion 28 and upper portion 29 when they are connected together. The body 35 comprises a pair of ring members 42 and 43 on either side thereof, each of which is mounted for axial movement along one of the rods 38 and 39. This is an advantageous arrangement because it is stable in a lateral direction and the restriction member 23 is prevented from twisting or laterally moving in use.

[0036] The springs 26 and 27 are mounted around the rods 38 and 39 respectively, between internal rearward

surface 44 of the internal chamber 30 and the ring members 42 and 43 respectively. This arrangement is advantageous because the pair of springs 26 and 27 share the work load in use, and because they are kept in line with the axis B-B by the rods 38 and 39 located inside them.

[0037] The internal chamber 32 also comprises an internal forward surface 45, and the body 35 comprises stop members 46 and 47 on either side thereof which each abut against a portion of the internal forward surface 45 when the restriction member 23 is in the first position, as shown in Figure 2. This structure delimits the forward position of the restriction member 23 and prevents it from exiting the housing 24.

[0038] The housing 24 tapers inwardly from the rear wall 37 to a front wall 48 thereof. Referring to Figure 8, the dock 22 has a corresponding tapering shape. In particular, the tapering indentation 21 comprises a first tapering section 49 which is shaped to receive the housing 24 from the rear wall 37 to the front wall 48 thereof. The first tapering section 49 ends with a pair of lateral extensions 50 and 51, before a narrower second tapering section 52 defines the edge 5 of the static panel 6 which functions to define the opening 4. Referring back to Figure 1, the housing 24 comprises side slots 53 and 54 on opposite sides thereof which are created by the shapes of lower portion 28 and upper portion 29 when they are connected together. Referring to Figure 5, the dock 22 then comprises tabs 55 and 56 on opposite sides thereof which are disposed in the slots 53 and 54 respectively when the housing 24 is located in the dock 22. The tabs 55 and 56 are simply the peripheral parts of the of the first tapering section 49 of the tapering indentation 19. With this arrangement the housing 24 is held securely in the dock 22 and is prevented from rotating about axis B-B in use.

[0039] The housing 24 also comprises front slots 57 and 58 which are also created by the shapes of the lower portion 28 and the upper portion 29 when they are connected together. The front slots 57 and 58 are intercepted by the aperture 34. Referring to Figure 8, the dock 22 comprises lateral tabs 59 and 60. When the housing 24 is located in the dock 22 the lateral tabs 59 and 60 are located in the front slots 57 and 58. The lateral tabs 59 and 60 are simply the peripheral parts of the lateral extensions 50 and 51. With this arrangement the housing 24 is held securely in the dock 22 and is prevented from rotating about an axis normal to axis B-B in use. As shown in Figure 7, when the housing 24 is fully slotted into the dock 22 the neck portion 26 of the restriction member 23 overlies the static panel 6.

[0040] As is clear from Figures 5 and 6 the housing 24 is freely removably mounted in the dock 22, in the sense that it is not restrained in the direction of axis B-B. What this means is that pressure applied to the leading surface 7 in use biases the housing 24 in an outward direction from the dispenser 1. Obviously the function of restricting the flow of the web of paper through the opening 4 is not going to work if the housing 24 actually moves in an outward direction from the dispenser 1. However, once the dispenser 1 is mounted to a wall or fixed vertical surface, as described above, the housing 24 is captured between the dispenser 1 and the wall or fixed vertical surface, and cannot move in the direction of axis B-B.

[0041] Referring back to Figures 1 and 2 the restriction member 23 comprises a manual operation tab 61 on an underside 62 thereof. This allows easy manual manipulation of the restriction member 23 in use, allowing the opening 4 to be increased in size. This can be done in order to make it easier to thread the end of the web of paper through the opening 4 prior to use. It also allows for the opening 4 to be manually increased in size to allow users to draw out a long length of the web of paper without it separating along any of its lines of perforation due to any restriction being applied. This might be done if a lot of paper is needed at once.

[0042] The restriction member 23 comprises a removable head part 63 at its outer end 25. The removable head part 63 comprises an interface portion 64 and the leading surface 7. The interface portion 64 comprises a pair of sockets 65 which interface with a pair of bosses (not visible), provided at the outer end 25 of the restriction member 23. When the removable head part 63 is mounted on the restriction member 23 the leading surface 7 is disposed at a particular position relative to the outer end 25. As such, it creates an opening 4 of a particular size when the restriction member 23 is in the first position, as shown in Figure 7. This construction allows for the head part 63 to be removed and replaced with others in which the leading surface is nearer or further from the outer end 25 of the restriction member 23 in order to create smaller or larger openings 4 to accommodate thinner or thicker paper. If the paper has a lesser weight then a smaller opening is required in order for the function of restricting the flow of the web of paper through the opening 4 to work correctly. The opposite is also true.

[0043] The leading surface 7 is concave in a plane parallel with the axis B-B. It actually comprises a central annular portion 66 bordered by straight tapering sections 67. As is most clearly seen in Figure 6, the second tapering section 52 of the tapering indentation 21 is also concave in the plane parallel with the axis B-B. Again, it comprises a central annular portion 68 bordered by straight tapering sections 69. As mentioned above, the original design purpose of the tapering indentation 21 was to serve as a tapering cutting formation against which non-perforated paper being dispensed can be jammed in order for the user to tear off a piece. It could still be used for this purpose if the restriction component 8 were removed from the dispenser. For this reason it needs to have the central annular portion 68 bordered by the tapering sections 69, in order to facilitate the jamming of paper therein.

[0044] Anyhow, as shown in Figure 7, these shapes of the leading surface 7 and the edge 5 of the static panel 6 result in the opening 4 comprising a generally annular shape with opposing annular sections arranged on the

axis B-B formed by the central annular portions 66 and 68, and convex sides formed by the overlaid and opposing straight tapering sections 67 and 69. When the position of the leading surface 7 moves rewardly on axis B-B, either as a result of compression of the springs 26 and 27 in use, or by virtue of an alternative removable head 63 being used in which the leading surface 7 is further from the outer end 25 of the restriction member 23, the result is that the opening 4 increases in both length and width. The opposing annular sections formed by the central annular portions 66 and 68 move apart on axis B-B to increase the length of the opening 4, while the outermost points of the convex sides where the overlaid straight tapering sections 67 and 69 meet move further away from axis B-B to increase the width of the opening 4. When the position of the leading surface 7 moves forward on axis B-B the opposite occurs, and the opening decreases in both length and width.

[0045] In use the sheets dispensers 1 operates as follows. The dispenser 1 is mounted to a wall or other fixed vertical surface, by means of the mounting holes 19, in the known way. The housing 24 is located in the dock 22 with the tabs 55 and 56 located in the slots 53 and 54, and the lateral tabs 59 and 60 located in the front slots 57 and 58. In this position the housing 24 is arranged with its rear surface 9 level with a plane of the rear surface 18 of the base 11. As such, it is retained inside the dock 22 by the wall or other fixed vertical surface.

[0046] In this position the neck portion 26 of the restriction member 23 overlies the static panel 6, and the opening 4 is defined by the leading surface 7 and the edge 5, as shown in Figure 7.

[0047] The cover 12 is then rotated through about 90 degrees about the hinge it shares with the base 11 to expose the storage compartment 14. A roll of paper to be dispensed (not shown) is then placed on its end on the platform 16. The roll of paper comprises a web of paper with lines of perforation at pre-determined intervals along its length. The central core is removed and the web of paper is then drawn from the inside of the roll, and fed through the aperture 17.

[0048] The web of paper is then fed through the opening 4 of the exit port 3. In order to facilitate this loading step the user can depress the operation tab 61 to push the restriction member 23 rearward against coil springs 26 and 27. This increases the size of the opening 4 and makes threading the paper therethrough easier. Once the web of paper is threaded through the opening 4 the operation tab 61 is released and the opening 4 returns to the size shown in Figure 7, thereby capturing the web of paper therein. The web of paper is compressed into a collapsed stated at the point it passes through the opening 4 by the force applied by the coil springs 26 and 27 acting on the restriction member 23 and the leading surface 7.

[0049] The force required to pull the web of paper through the opening 4 is greater than that required to separate a section of the web of paper from the rest along a line of perforation. It will be appreciated that there are a combination of forces acting on the web of paper to facilitate this. Firstly, the coil springs 26 and 27 drive the restriction member 23 forward along the axis B-B to maintain the opening 4 at its smallest size. They can be driven back in use, and if so they act against any such opposite force to maintain the opening 4 at the smallest size possible. Secondly, the web of paper itself exerts a radial extension force on the opening 4 which also restricts its flow therethrough. Further, if the web of paper is drawn through the opening 4 at any angle other than that of the dispensing axis A-A, this angular displacement will also restrict the flow of the web of paper through the opening 4.

[0050] Once the web of paper is captured in the opening 4 the cover 12 is rotated back to its first position relative to the base 11, as shown in Figure 3. The dispenser 1 is now ready for use. A user grasps the section of the web of paper which extends from the opening 4 and draws it in a generally downward direction. As they do this the web of paper is drawn from the inside of the roll and passes through the aperture 17 and the opening 4, along the dispensing axis A-A. As explained above. This action continues until a line of perforation has passed through the opening 4. As the force being exerted on the web of paper by the user to draw it through the opening 4 is greater than that required to tear the web of paper along the perforation, once the line of perforation has passed through the opening 4 the web of paper separates at that point and the user is left with one dispensed paper towel. As the web of paper is moving through the opening 4 when this happens, and as it takes a short period of time for the perforation to tear, a short section of the web of paper is left protruding from the opening 4 for the next user.

[0051] It will be appreciated that because the restriction member 23 is mounted on coil springs 26 and 27 the leading surface 7 has a live position relative to the edge 5 of the static panel 6. The leading surface 7 can move back and forth in use as the web of paper is drawn through the opening 4 as described above. This leads to a smoother operation of the dispenser 1, in particular if the manner in which the web of paper is being compressed as it is drawn towards and through the opening 4 changes, leading to a greater or lesser lateral extension force being applied thereby. The spring mounted leading surface 7 also allows for paper of greater or lesser weights to be used, because the opening 4 has an adjustable size. If a web of paper with a lesser weight is being used then the opening 4 can be maintained at a smaller size, as shown in Figure 7. However, if the user loads a web of paper of a greater weight into the dispenser, the opening 4 will still function correctly because the leading surface 7 can be held further back by the paper, against the force of the coil springs 26 and 27.

[0052] As is clear from Figure 7, the leading surface 7 has a depth in the direction of the dispensing axis A-A. As such, the leading surface 7 acts on the web of paper over a depth which is greater than that provided by the

leading edge 5 of the static panel 6. This allows the leading surface 7 to apply a more effective compression force on the web of paper as it passes through the opening 4.

[0053] As explained above the opening 4 is generally annular, which allows the web of paper to pass therethrough without being damaged. Furthermore, when the leading surface 7 moves rewardly on axis B-B the result is that the opening 4 increases in both length and width. The opposing annular sections formed by the central annular portions 66 and 68 move apart on axis B-B to increase the length of the opening 4, while the outermost points of the convex sides where the overlaid straight tapering sections 67 and 69 meet move further away from axis B-B to increase the width of the opening 4. When the position of the leading surface 7 moves forward on axis B-B the opposite occurs, and the opening 4 decreases in both length and width. This means that when the web of paper exerts an extension force on the opening 4, the opening 4 increases in both length and width to facilitate its throughflow.

[0054] In the event that a user requires more than one section of the web of paper at a time they can depress the operation tab 61 to manually increase the size of the opening 4 to its maximum size. This should allow the web of paper to be drawn through the opening 4 without sufficient restrictive force to facilitate its separation along any line of perforation. Once the desired quantity of paper has been withdrawn the operation tab 61 can be released and the leading surface 7 reapplied to the web of paper.

[0055] The web of paper is drawn through the opening 4, and separated into individual paper towels, until it is entirely consumed. The dispenser 1 can then be opened and a new roll of paper can then be loaded therein as described above.

[0056] In the event that paper of a significantly greater or lesser weight is to be dispensed, the user can replace the removable head part 63 with another in which the leading surface is nearer or further from the outer end 25 of the restriction member 23, in order to set the opening 4 at a smaller or larger initial size. To do this the user can reach down through the aperture 17, to lift the removable head part 63 from the neck portion 36, and replace it with another. Alternatively, the dispenser 1 can be removed from the wall or other fixed vertical surface, and the housing 24 removed from the dock 22. Once the housing 24 is free of the dispenser 1 the removable head part 63 can be readily replaced. The housing 24 can then be placed back in the dock 22, and the dispenser 1 remounted to the wall or other fixed vertical surface. As there is nothing retaining the housing 24 in the dock 22 its removal and placement therein is very simple.

[0057] In the event that the housing 24 is damaged, or if a user does want to apply any restrictive force to the web of paper being dispensed (for example it if has no lines of perforation), they can just remove the housing 24 as described above and the dispenser 1 will still operate in a more basic way. The web of paper will extend through the tapering indentation 21, and to remove a piece the user can draw out a desired length of paper before jamming the web of paper into the second tapering section 52, up against the edge 5 of the static panel 6, in order to manually tear off a piece. This is how basic centrepull paper dispensers operate.

[0058] The second aspect of the present invention defines a spring loaded restriction device for use in constructing a sheets dispenser as defined in any of claims 2-16 below. The housing 24 provides full support for this second aspect of the present invention because it can be appreciated how it can be separately manufactured and sold. In fact, the housing 24 can be mounted into the rear tapering cutting indentation of one of the applicant's earlier centrepull dispenser designs.

[0059] The third aspect of the present invention defines a kit of parts comprising a sheets dispenser as defined in claim 12 below, and one or more further removable head parts. The above description provides full support for such a kit of parts, because it can be appreciated how dispenser 1 can be sold along with two or more removable head parts 63 of differing sizes.

[0060] The present invention can be altered without departing from the scope of claim 1. For example, in one alternative embodiment (not shown) the restriction component is a single moulded part with a leading surface at one end and a rear surface at the other. In this construction the opening has a fixed size, which might be preferred.

[0061] In another alternative embodiments (not shown) the restriction components are mounted in the dispensers with rear surfaces thereof level with planes of external surfaces of the dispenses other than the rear surface, and they are held in position by connection mechanisms. For example, in one such version (not shown), the restriction component is mounted in the side of the dispenser, and is held in place with pin or screw.

[0062] Therefore, the present invention provides a centrepull paper dispenser with a restriction component removably mounted therein. This allows for a modular approach, with the same main dispenser parts being used for a simplex centrepull paper dispenser product without any restriction feature, as well as for an enhanced version featuring such a function. Furthermore, it is also possible to retro-fit the restriction component to existing products, and such a device forms the second aspect of the present invention. In addition, a spring loaded restriction feature is provided which allows for papers of different weights to be accommodated using the same components. The spring loading also facilitates a smoother dispensing action. In addition, the feature of removable head parts allows even greater diversity of paper weights to be accommodated.

Claims

1. A sheets dispenser comprising a container with an exit port, in which said exit port comprises an opening

partly defined by an edge of a static panel of said dispenser and partly defined by a leading surface of a restriction component, and in which said restriction component is removably mounted in said dispenser with a rear surface thereof level with a plane of an external surface of said dispenser.

2. A sheets dispenser as claimed in claim 1 in which said restriction component is freely removably mounted in said dispenser, such that pressure applied to said leading surface in use biases said restriction component in an outward direction from said dispenser.

3. A sheets dispenser as claimed in claim 2 in which said restriction component comprises a spring loaded restriction member mounted for displacement in a housing, in which said restriction member comprises said leading surface at an outer end thereof, in which said restriction member is biased into a first position in which said opening is a first size, and is displaceable along an axis against said spring loading to increase the size of said opening, and in which said housing comprises a rear wall substantially normal to said axis which has said rear surface as an external side thereof.

4. A sheets dispenser as claimed in claim 3 in which said dispenser comprises a base and a cover, in which said cover is movable from a first position in which it is attached to a front of said base to form said container, and a second position in which it is displaced from said base to expose a storage compartment, in which said external surface comprises a rear surface of said base.

5. A sheets dispenser as claimed in claim 4 in which said storage compartment comprises a platform for supporting a roll of material with which said sheets dispenser is used, in which said exit port is disposed below said platform, in which said platform comprises an aperture, in which said aperture and said opening are aligned on a dispensing axis.

6. A sheets dispenser as claimed in claim 3 in which said housing comprises an internal chamber, an axial track provided inside said internal chamber and an aperture, in which said restriction member comprises a body mounted for axial movement along said track and a neck portion which extends through said aperture and which comprises said leading surface an outer end thereof.

7. A sheets dispenser as claimed in claim 6 in which said track comprises a pair of parallel rods arranged on either side of said axis, in which said body comprises a pair of ring members on either side thereof, each of which is mounted for axial movement along one of said rods, in which said spring loading comprises a pair of coil springs, each one mounted around one of said rods between an internal rearward surface of said internal chamber and said ring member mounted on said rod, in which said internal chamber comprises an internal forward surface, and in which said body comprises stop members on either side thereof which each abut against a portion of said internal forward surface when said restriction member is in said first position.

8. A sheets dispenser as claimed in claim 3 in which said restriction member comprises a manual operation tab on an underside thereof.

9. A sheets dispenser as claimed in claim 3 in which said restriction member comprises a neck portion with a removable head part at an outer end thereof, in which said removable head part comprises said leading surface.

10. A sheets dispenser as claimed in claim 3 in which said leading surface is concave in a plane parallel with said axis.

11. A sheets dispenser as claimed in claim 1 in which said edge of said static panel is concave in said plane parallel with said axis.

12. A sheets dispenser as claimed in claim 4 in which said housing tapers inwardly from said rear wall to a front wall thereof, in which said rear surface of said base comprises a dock with a tapering shape corresponding to that of said housing.

13. A sheets dispenser as claimed in claim 12 in which said housing comprises slots on opposite sides thereof, in which said dock comprises tabs on opposite sides thereof which are disposed in said slots when said housing is located in said dock.

14. A spring loaded restriction device for use in constructing a sheets dispenser as defined in any of claims 2-13, in which said spring loaded restriction device comprises a housing and a spring loaded restriction member mounted for displacement therein, in which said restriction member comprises a leading surface at an outer end thereof, in which said restriction member is biased into a first position in which it can define an opening with an edge of a static panel of a sheets dispenser with which it is used, in which said restriction member is displaceable along an axis against said spring loading so as to increase the size of said opening, and in which said housing comprises a rear wall substantially normal to said axis.

15. A kit of parts comprising a sheets dispenser as defined in claim 9 and one or more further removable

head parts each shaped such that when mounted on said neck portion a leading surface thereof is disposed at a different distance from said outer end of said neck portion than said leading surface of said head component when it is mounted on said neck portion, as well as leading surfaces of each of said others of said further head components when they are mounted on said neck portion.

Figure 1

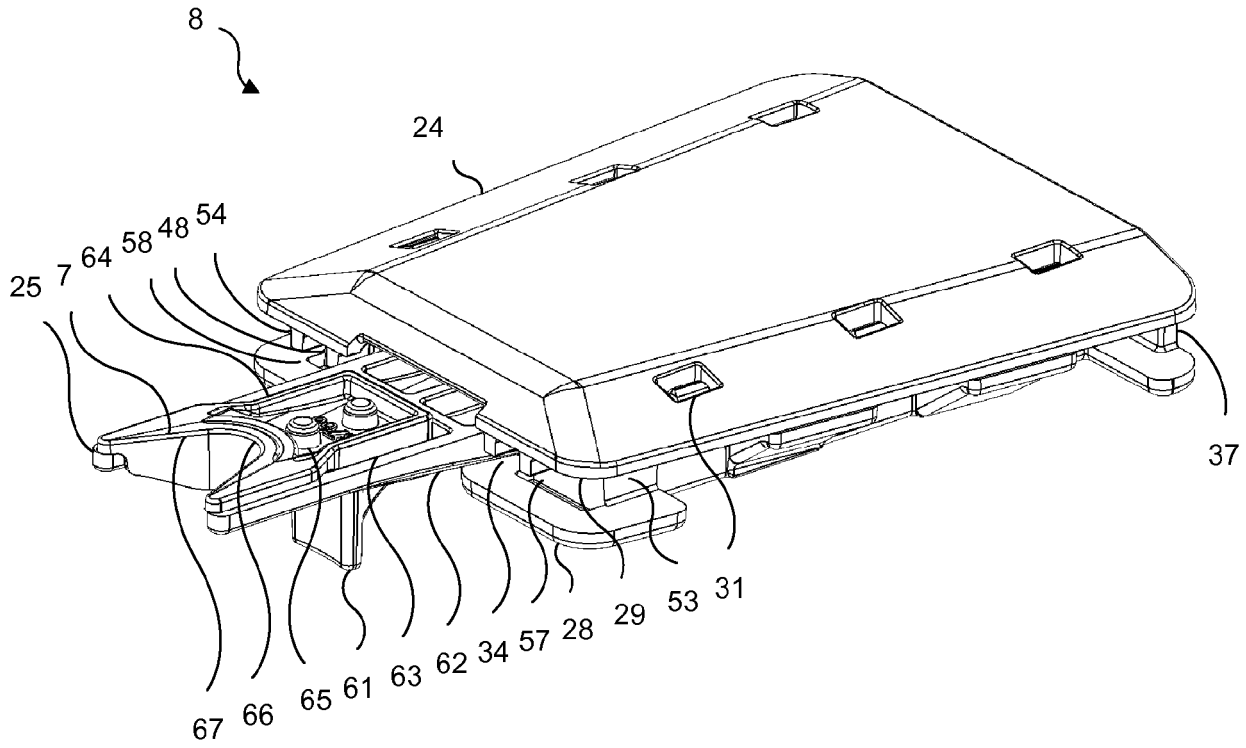


Figure 2

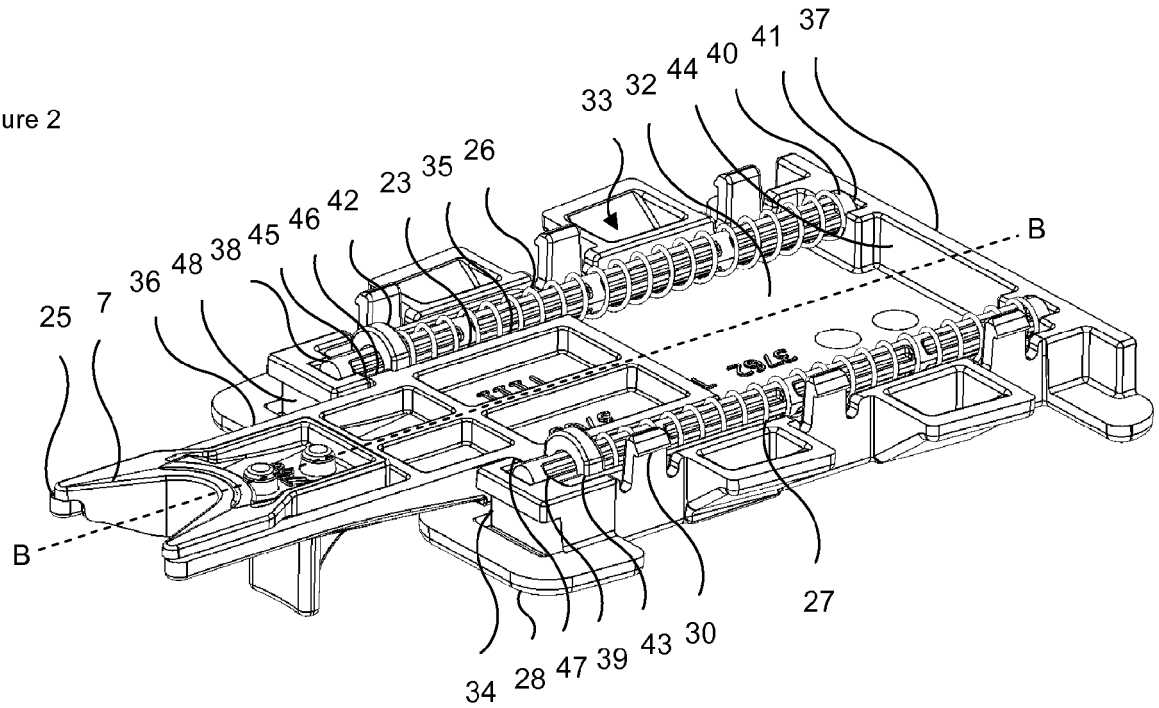


Figure 3

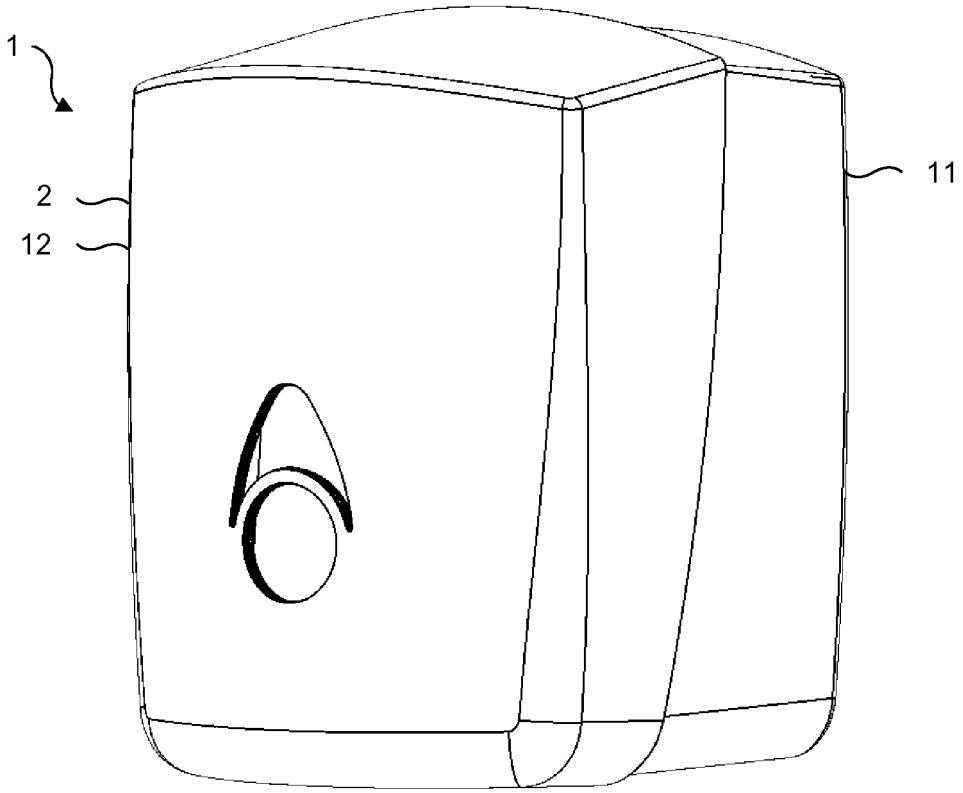


Figure 4

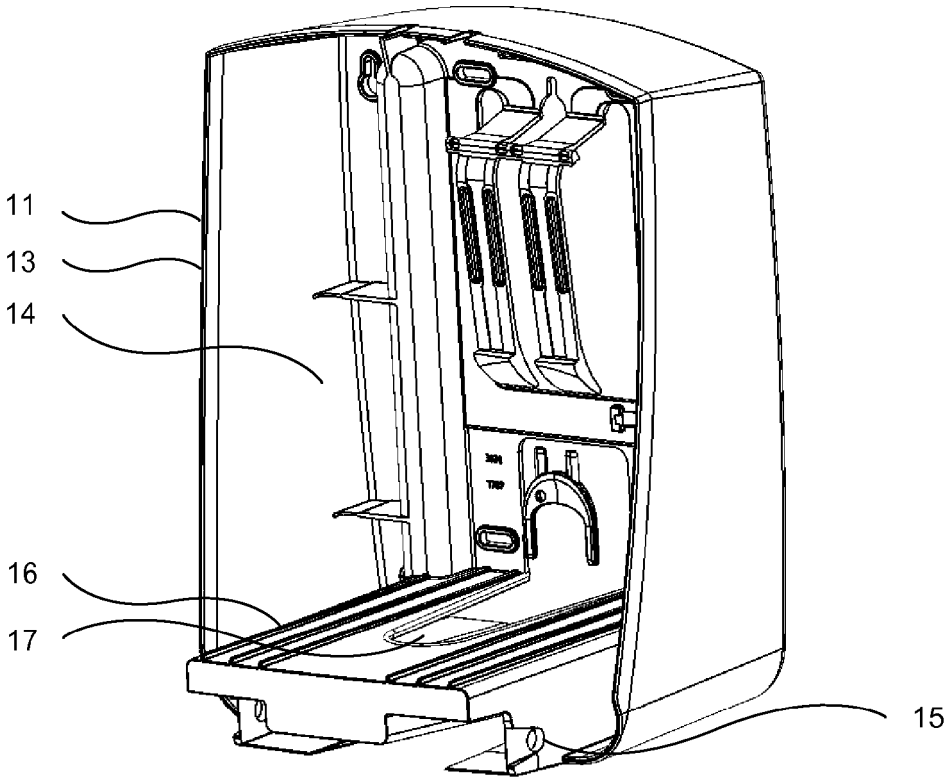


Figure 5

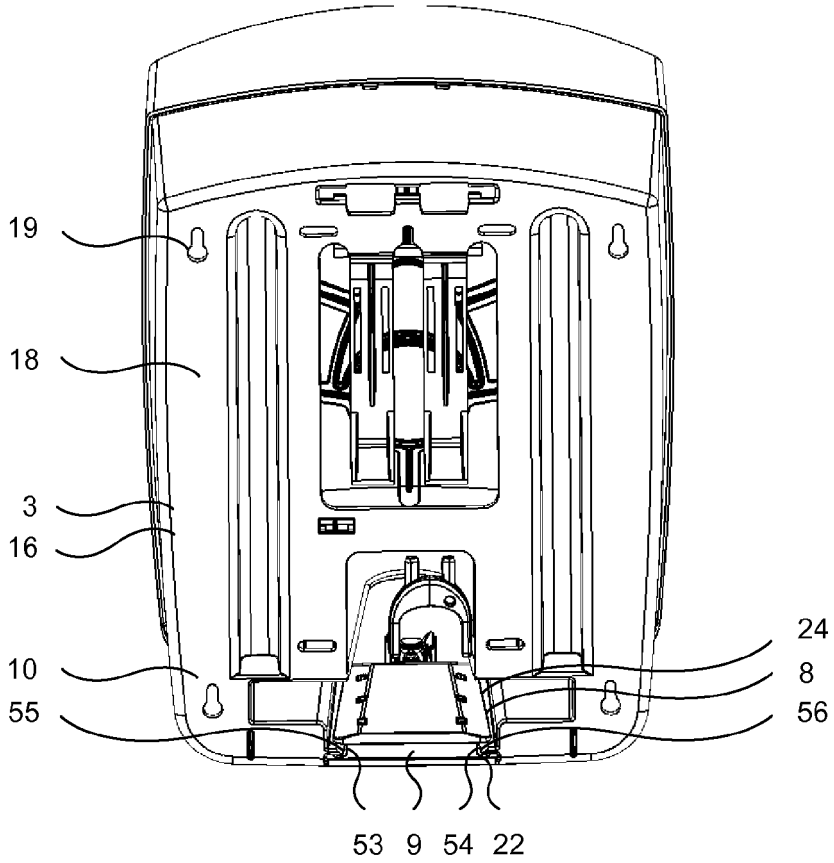


Figure 6

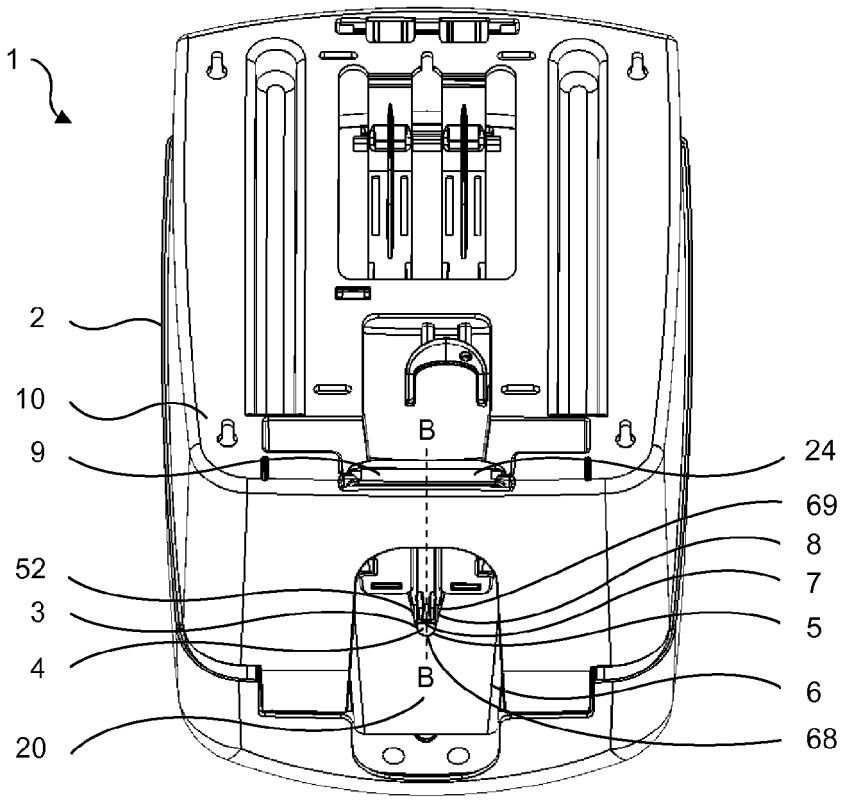


Figure 7

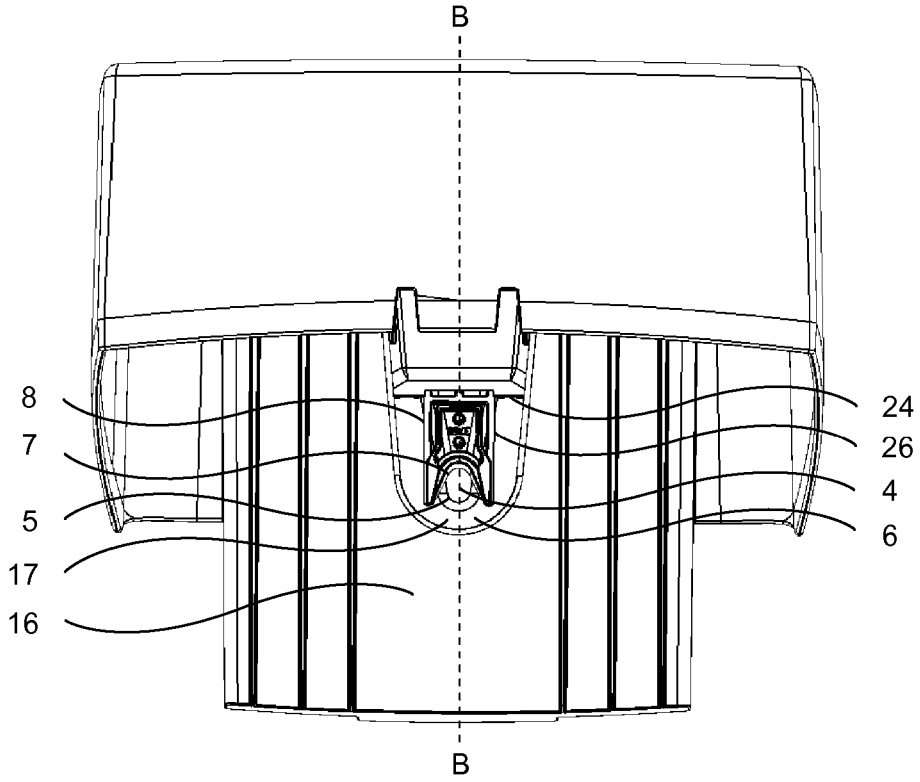
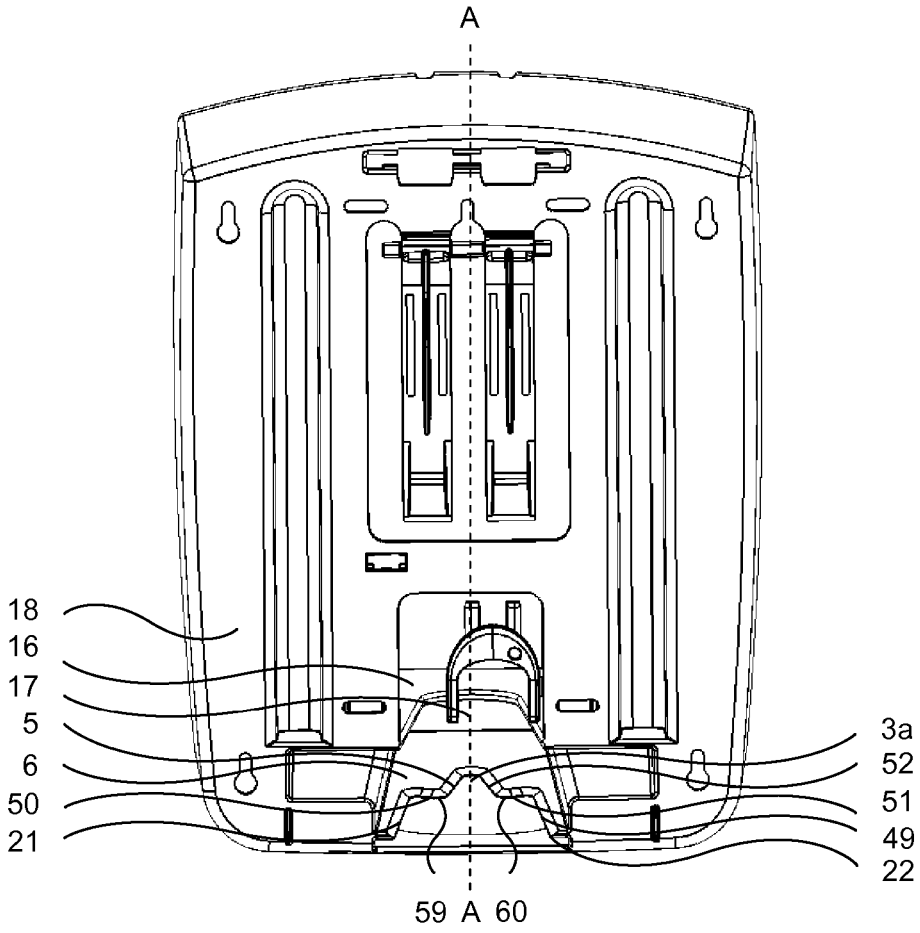


Figure 8



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EUROPEAN SEARCH REPORT

Application Number
EP 19 16 8640

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 6 267 321 B1 (TRAMONTINA PAUL [US]) 31 July 2001 (2001-07-31) * column 1, lines 24-38 * * column 4, line 14 - column 5, line 35 * * figures *	1-15	INV. A47K10/38
A	US 2008/290210 A1 (TRAMONTINA PAUL FRANCIS [US] ET AL) 27 November 2008 (2008-11-27) * paragraphs [0004], [0045], [0051], [0054], [0055], [0056], [0064], [0065]; figures 1-7 *	1-15	

TECHNICAL FIELDS SEARCHED (IPC)

A47K

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	29 October 2019	Urbahn, Stephanie

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29-10-2019

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6267321 B1	31-07-2001	CA 2349397 A1	27-12-2001
		MX PA01006646 A	30-07-2004
		US 6267321 B1	31-07-2001
US 2008290210 A1	27-11-2008	AU 2008252491 A1	27-11-2008
		BR PI0810325 A2	14-10-2014
		CA 2688253 A1	27-11-2008
		CN 101677725 A	24-03-2010
		EP 2152133 A2	17-02-2010
		KR 20100021416 A	24-02-2010
		RU 2009147815 A	27-06-2011
		US 2008290210 A1	27-11-2008
		WO 2008142582 A2	27-11-2008

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