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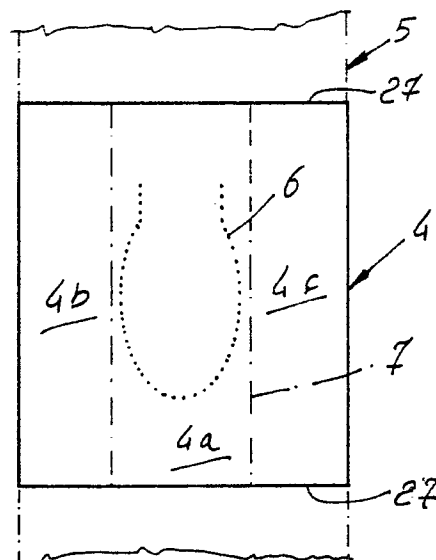
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(54) **Method and apparatus for manufacturing paper seat covers, particularly for lavatories, and seat covers obtained thereby.**

(57) The method of manufacturing paper seat covers (4) comprises providing a paper band (5), pre-cutting a tear-line (6) of a hole for opening a seat cover (4) on the paper band (5), and folding the paper band according to two longitudinally parallel folding lines (7) to define a central portion (4a) and two outer portions (4b,4c). The outer portions (4b,4c) are then folded onto the central portion (4a) and onto one another, and the band (5) is cut transversely along cutting lines (27) to obtain a rectangular segment containing the tear-line. The segment is then folded transversely inwardly and the seat covers are gathered to obtain a pack.

FIG.2



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METHOD AND APPARATUS FOR MANUFACTURING PAPER SEAT COVERS, PARTICULARLY FOR LAVATORIES, AND SEAT COVERS OBTAINED THEREBY.

The present invention relates to a method and apparatus for manufacturing paper seat covers, particularly for lavatories, and to the seat covers thus manufactured.

As is known, current lavatory seat covers, are constituted by a sheet of paper with an incision which defines a central hole; this incision constitutes the tear-line which allows to open the seat cover for use (see figure 1).

Such seat covers are generally folded in two parts transversely to the paper band from which they are obtained. The dimensions of the seat cover, however, are still considerable even when folded, since only one dimension of the product is approximately halved.

The paper used to manufacture these products furthermore generally has an extremely low weight (approximately 20 gr/sq.m.), so that even when folded in two it assumes no appreciable rigidity and is therefore difficult to manipulate; the incision provided at the center of the sheet also accentuates this problem. These products are therefore marketed in packages with a rigid and self-supporting container, for example in micro-corrugated cardboard, which has a high cost with respect to the value of its contents. These packages must furthermore be produced almost entirely by hand, due to the difficulty in handling the sheets of paper, which tend to twist and crumple when they are inserted into the cardboard container.

Another disadvantage, due to the considerable dimensions of the products and therefore of their containers, resides in the fact that the space required to place said containers in toilets is not always available, especially in the lavatories of aircraft, trains, ships and the like.

Furthermore, due to the above described reasons, the packages can only contain a limited number of products, usually no more than approximately 200. In fact with a larger number of products the distance between the inner walls of the container is so large that after removing a certain number of products the remaining ones crumple in disorder inside the package.

It is furthermore observed that the individual products are difficult to grip and extract from the container. Said products must in fact be extracted delicately, and possibly using both hands, since the flap to be gripped consists of a single thin sheet of paper, while the products to be extracted are of considerable size.

Smaller packages of lavatory seat covers are also commercially available; said packages are

formed with sheets of paper folded in more than two parts. The folding and packaging operations, however, must currently be completely or partially performed by hand, with obvious cost increases.

5 The aim of the present invention is to solve the above described problem by providing a process which allows to automatically manufacture paper seat covers, in particular for lavatory seats, folded so that they are compact and easy to handle.

10 Within the scope of this aim, an object of the present invention is to provide an apparatus which allows the manufacture of paper seat covers with the method according to the invention in a technically simple manner, and which is safe, versatile in use, and reliable in operation.

15 This aim and object, and other objects which will become apparent hereinafter, are achieved, according to the invention, by a method for manufacturing paper seat covers, in particular for lavatories, which is characterized in that it comprises the steps of providing a paper band, pre-cutting a tear-line of a hole for opening a seat cover on said paper band, folding said paper band along two parallel longitudinal folding lines to define a central portion and two outer portions, folding said outer portions onto said central portions and onto one another, transversely cutting said band to obtain a rectangular segment containing said tear-line, transversely inwardly folding said segment and, gathering said seat covers thus obtained into a pack.

20 The method is performed, according to the present invention, by an apparatus for manufacturing paper seat covers which is characterized in that it comprises an assembly for pre-cutting a tear-line of a hole for opening the seat cover on a band of paper, a device for longitudinally folding said paper band along two longitudinally parallel folding lines to define a central portion and two outer portions adapted to be folded onto said central portion and onto one another, an assembly for flattening the folds of said outer portions folded onto said central portion, a cutting device adapted to provide appropriately spaced transverse cuts to obtain individual segments constituting said seat covers, and a device for transversely inwardly folding said segments.

25 The details of the invention will become apparent from the detailed description of a preferred embodiment of the method and apparatus for manufacturing paper seat covers, as illustrated merely by way of non-limitative example in the accompanying drawings, wherein:

figure 1 is a view of a conventional seat cover, opened out and folded;

figures 2, 3, 4, and 5 illustrate a seat cover according to the present invention, respectively in successive steps of the method according to the invention;

figure 6 is a schematic longitudinal sectional view of the apparatus for manufacturing paper seat covers according to the present invention;

figure 7 is a partial plan view of the apparatus;

figure 8 is a detail sectional view thereof according to the line VIII-VIII of figure 6.

With reference to figure 1, the reference numeral 1 indicates a conventional paper seat cover for lavatories. Said seat cover has a tear-line 2 provided by pre-cutting and defining the central hole to be opened for use. The product is folded in two portions 1a, 1b along the transverse folding line 3; the two portions 1a, 1b are slightly offset, the folding line 3 being offset with respect to the centerline of the paper sheet.

Figures 2, 3, 4 and 5 illustrate the successive steps of the manufacture of the seat cover according to the present invention, which is generally indicated by the reference numeral 4. Said seat cover is obtained starting from a paper band, indicated by the broken line 5, and has a tear-line 6 provided by pre-cutting which defines in a known manner the hole to be opened for use.

Two parallel folding lines 7 are provided longitudinally to the paper band 5 and divide the paper sheet into three portions. In particular said folding lines define a central portion 4a completely containing the tear-line 6 and two outer portions 4b, 4c symmetrically lateral to the central portion, as illustrated in figure 2.

The two outer portions 4b, 4c are intended to be folded onto the central portion 4a, partially superimposed on one another (see figures 3 and 4). The sheet is then further folded along the transverse folding line 8 which is slightly offset with respect to the transverse centerline of said sheet.

In the folded configuration of figure 5 the dimensions of the seat cover 4 are thus equal to approximately one third of those of conventional seat covers 1 shown in figure 1. As a consequence of the multiple folding, substantially into six overlapping portions, the seat cover 4 furthermore has greater consistence than conventional ones in its final configuration despite being made of very thin paper.

The seat cover is conveniently made of embossed paper. Embossing gives the paper more consistence and softness, improving the product's quality. Seat covers thus obtained are in fact softer, provide improved tactile response and are more

stable on the lavatory by virtue of their rougher surface.

The seat cover 4 can be manufactured automatically and continuously starting from the paper band 5 by means of an apparatus generally indicated by the reference numeral 9 and illustrated in figures 6, 7 and 8.

The apparatus 9 has, along a line, an assembly 10 for embossing the paper band 5 formed by a pair of counter-rotating rollers 11 and 12 and an assembly 13 for pre-cutting the tear-line 6 with a pre-cutting roller 14 which cooperates with a rubber roller 15 rotatable in the direction indicated by the arrow A. The pre-cutting roller 14 is adapted to provide a series of discontinuous linear or closely spaced point-like incisions.

The paper band 5 in output from the pre-cutting assembly 13 is transported by means of the tensioning rollers 16 and 17 to a longitudinal folding device 18. The folding device 18 comprises a laminar pad 19 having, at its inlet, an inclined portion 19a which directs the paper band 5 below said pad.

The pad 19 is supported by an arm 20 and extends longitudinally with a width equal to the distance between the folding lines 7 to be provided on the paper band 5. Appropriate folding means 21 act on the lateral portions of the band 5 to progressively fold them upwards with respect to the longitudinal edges of the pad 19 and subsequently fold them in the direction of the arrows B, as shown in figure 8.

Below the pad 19 there is a pair of belts 22 rotatable on wheels 23 in the direction indicated by the arrow C. The belts 22 have an upper arm which extends parallel to the pad 19 and adjacent to the edges of said pad to engage the paper band 5 at its central portion 4a proximate to the folding lines 7. The paper band 5 is therefore advanced engaged between the lower belts 22 and the upper pad 19 so that the folding performed by the folding means 21 does not cause dangerous stresses in the material, preventing it from weakening and most of all from tearing at the lines 6 provided evenly spaced along said band.

Alternately, a single larger belt arranged centrally to the pad 19 or other similar advancement means can be used for the above described purpose.

It should be noted that the belts 22 maintain the continuity of the paper sheet 5, even if the tear-line 6 of the central hole is accidentally broken, by keeping it in contact with the pad 19 during its advancement. The pad 19 is furthermore wide enough to have its longitudinal edges arranged to the outside of the tear-line 6, so that the longitudinal folds remain, in turn, at the outside of the central hole.

When the band leaves the region in which it is engaged by the pad 19 and the belts 22, it is folded longitudinally into three portions, as previously illustrated in figures 3 and 4. In this folded condition the band is transported to a fold flattening assembly, generally indicated by the reference numeral 24, formed by counter-rotating rollers 25. It should be noted that the belts 22 wind on a pair of said rollers 25.

The band then passes through a cutting device generally indicated by the reference numeral 26 and adapted to provide the appropriately spaced transverse cuts 27 separating the individual segments which constitute the seat covers. Said segments finally advance to a transverse folding device 28 which folds them along the line 8 as previously illustrated in figure 5. The folding device 28 has, in a known manner, a cylinder 29 rotating in the direction of the arrow D and having axial clamps 30 adapted to cooperate with a folding element 31 arranged above said cylinder. Two diametrically opposite clamps 30 are conveniently provided so as to perform two folding cycles at each turn of the cylinder 29. The clamps 30 close upon engagement with the folding element 31 to grip the segments and open to release said segments on a horizontal table 32 after rotating substantially through 90°.

The seat covers thus folded and arranged horizontally are then gathered in a pack on the table 32 which is arranged adjacent to the folding device 28 and has appropriate lateral shoulders.

The seat covers according to the present invention are therefore manufactured entirely automatically and have very compact dimensions, so that they can be packaged in similarly compact packages which can be placed in small spaces such as the toilets of aircraft, trains and the like. The reduced dimensions of the seat covers thus folded furthermore allow to produce travel packages without further handling or folding performed off-line and/or discontinuously and therefore with no additional cost.

The folded seat covers are quite rigid, and may be constituted, for instance by a plurality of superimposed thicknesses, such as six superimposed thickness of material. This allows to handle them easily so that the seat covers can be packaged in stacks or packets and then wrapped with non-rigid materials such as cellophane, paper and the like, or simply tied with a band or string, since the stack itself is inherently rigid and compact. The packaging operation can furthermore be completely automated by virtue of the above described features of the folded seat covers.

The seat covers according to the invention furthermore allow to use small refillable dispensers in metal or synthetic material which are easy to

manufacture and to use for the users, in particular in terms of gripping and extracting each individual product.

This ease in gripping and extracting derives, besides from the particular shape of the dispenser, from the compact dimensions and from the consistence of the seat covers. Since the cut edges of the seat cover are in fact offset, the grip portion is formed by three superimposed layers of paper.

Said seat covers furthermore allow to manufacture packages formed by a considerable number of products, thus increasing the time between one dispenser refilling operation and the next, reducing distribution and management costs.

The lower packaging cost is achieved by virtue of the fact that it is not necessary to use cardboard containers which have a relatively high cost, and by virtue of the fact that such packaging can be automated. In particular it is possible to combine the packaging machine with the apparatus used to manufacture the seat covers.

In the practical embodiment of the invention, the materials employed, as well as the shapes and dimensions, may be any according to the requirements.

Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the scope of each element identified by way of example by such reference signs.

Claims

1. Method for manufacturing paper seat covers, in particular for lavatories, characterized in that it comprises the steps of: providing a paper band, pre-cutting a tear-line of a hole for opening said seat cover on said paper band, folding said paper band along two longitudinally parallel folding lines to define a central portion and two outer portions, folding of said outer portions onto said central portion and onto one another transversely cutting said band to obtain a rectangular segment containing said tear-line, transversely inwardly folding said segment an, gathering said seat covers thus obtained into a pack.

2. Method according to claim 1, characterized in that said longitudinally parallel folding lines are located outside of said tear-line, so that said tear-line is entirely contained within said central portion of the paper band.

3. Method according to claim 1, characterized in that said paper band is embossed before pre-cutting said tear-line.

4. Method according to claim 1, characterized in that said pre-cutting is performed with closely spaced points.

5. Method according to claim 1, characterized in that said folding of the outer portions of the paper band is performed by engaging the central portion of said band with a laminar sliding pad and said outer portions with sliding folding means adapted to progressively fold said outer portions upwards with respect to the longitudinal edges of the pad and subsequently fold said outer portions inwards to superimpose them.

6. Method according to claim 5, characterized in that said paper band is advanced adherent to said laminar pad by continuous traction means.

7. Apparatus for manufacturing paper seat covers, in particular for lavatories, characterized in that it comprises an assembly for pre-cutting a tear-line of a hole for opening the seat cover on a band of paper, a device for longitudinally folding said paper band along two longitudinally parallel folding lines to define a central portion and two outer portions adapted to be folded onto said central portion and onto one another, an assembly for flattening the folds of said outer portions folded onto said central portion, a cutting device adapted to provide appropriately spaced transverse cuts to obtain individual segments constituting said seat covers, and a device for folding said segments transversely inwards.

8. Apparatus according to claim 7, characterized in that it comprises an assembly for embossing said paper band arranged ahead of said pre-cutting assembly.

9. Apparatus according to claim 7, characterized in that said longitudinal folding device comprises a laminar pad, arranged between underlying continuous traction means adapted to carry said paper band adherent to said pad, and overlying folding means, adapted to act on said outer portions of the band, to progressively fold them upwards with respect to the longitudinal edges of said pad and subsequently fold them onto said central portion.

10. Apparatus according to claim 9, characterized in that said continuous traction means comprise at least one belt having an upper arm which extends parallel to said pad, so as to engage said paper band at said central portion and keep it pressed against said pad.

11. Apparatus according to claim 9, characterized in that said traction means are constituted by a pair of belts arranged adjacent to the edges of said pad to engage said paper band proximate to said longitudinally parallel folding lines.

12. Apparatus according to claim 9, characterized in that said laminar pad extends longitudinally and has a width equal to the distance between said longitudinally parallel folding lines to be provided on said paper band.

13. Apparatus according to claim 7, characterized in that said assembly for pre-cutting the tear-line has roller means adapted to provide a series of discontinuous linear or closely spaced point-line incisions on said paper band.

14. Paper seat cover, in particular for lavatories, characterized in that it comprises a sheet obtained from a paper band with two longitudinally parallel folding lines adapted to divide said band into three portions, defining a central portion and two outer portions to be folded onto said central portion and onto one another, and a transverse folding line at which said sheets is further folded inwards.

15. Seat cover according to claim 14, characterized in that said sheet is obtained from an embossed paper band.

16. Seat cover according to claim 14, characterized in that a tear-line is provided by pre-cutting closely spaced points which defines the hole to be opened for use and is entirely contained in said central portion of the paper band.

17. Seat cover according to claim 14, characterized in that said transverse folding line is slightly offset with respect to its transverse center-line.

FIG.1

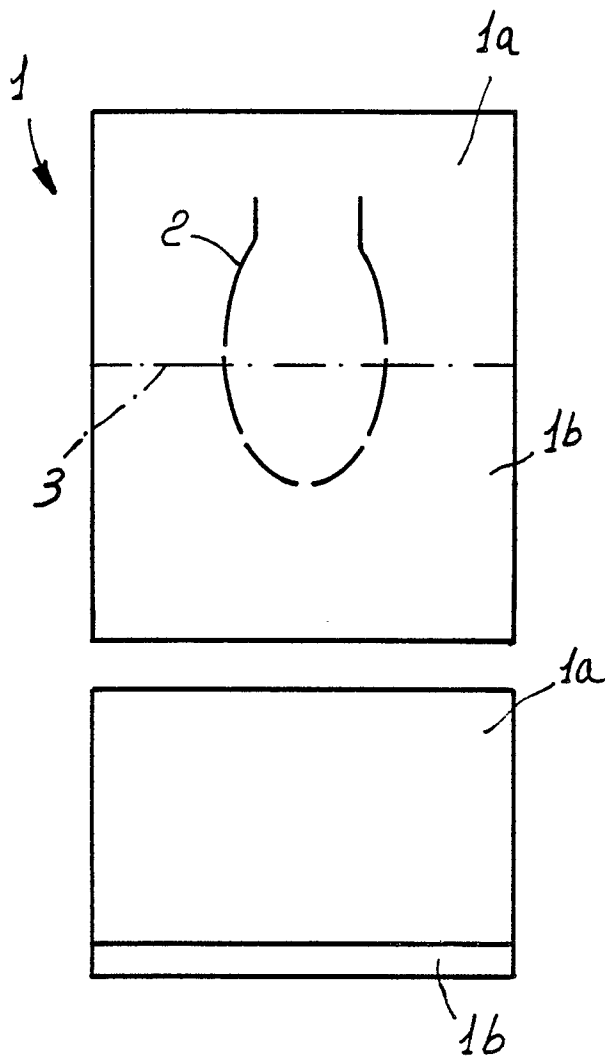


FIG.2

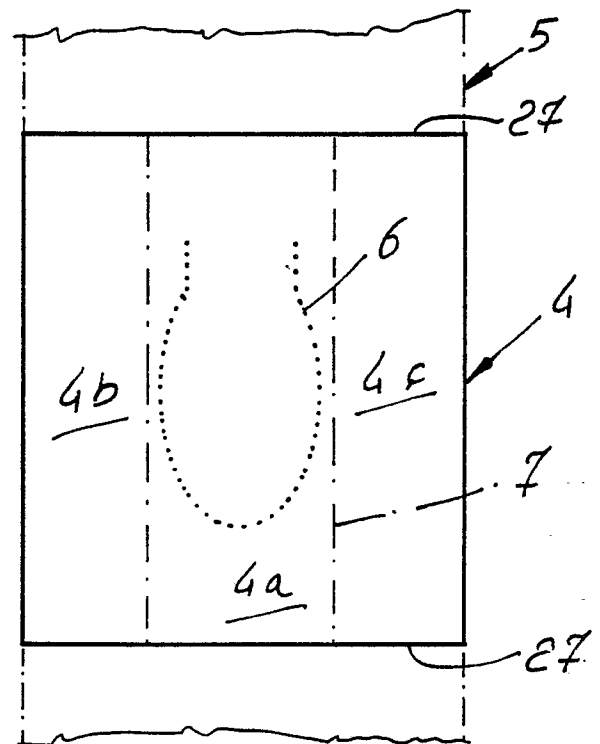


FIG.3

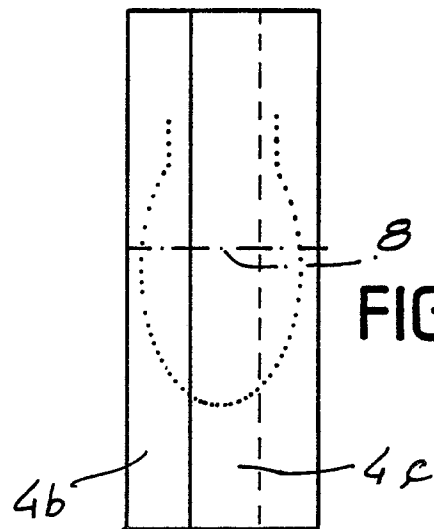


FIG.4

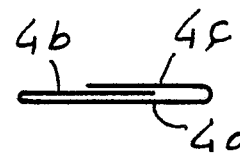


FIG.5

