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(54) **BOX WITH THE TISSUE DISPENSER**

(57) The box with a tissue dispenser composed of respective items connected along the creasing line (2,17,20); the bottom panel (1) with the closing flaps (6, 7) adjoining along the shorter creased lines (4, 5), the left lateral panel (3) with the closing-dust-flaps (10, 11) adjoining along its shorter creased lines (8, 9), the top panel (18) with closing flaps (14, 15) adjoining along the shorter creased lines (22, 23), lateral right panel (21) with closing dust flaps (26, 27) adjoining along the shorter creased lines (24, 25) characterized in that it has:

- an outer tissue dispenser that is the window (19), contained in the top panel (18), whose left edge is an arc-shaped creasing curve (O1) with the shape of the arc convex towards the creasing line (17), and the right edge is a wavy cut line (O2) with the shape of sinusoid section with one centre maximum and two side minima, wherein there is a pressed component (03) with the shape of the circle section less than or equal to semicircle with the diameter less than the width of the centre maximum, but shorter edges of the window (19) are the straight cut lines (04), which from one side connect to the archwise creasing line (O1) and from the other go beyond the sinusoidal cut line (OL2) and archwise curve into the inner side of the window (19).
- an inner tissue dispenser that is formed by the ejector (16) and the dispenser shelf (32).

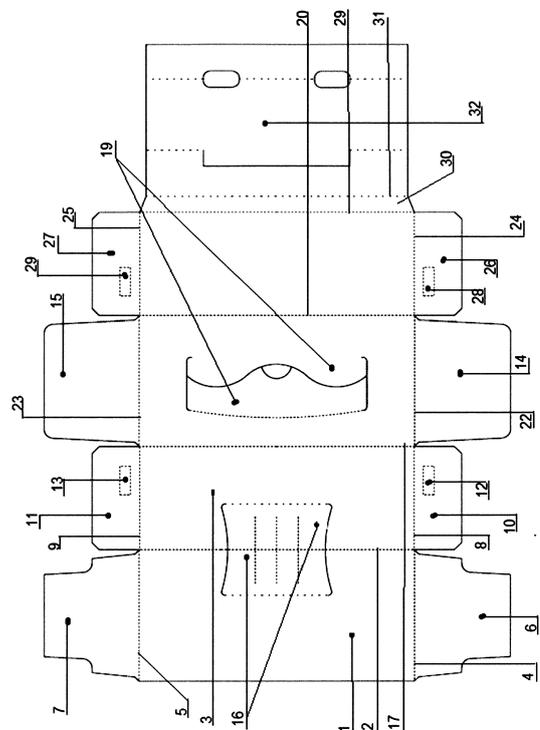


Fig.1

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## Description

**[0001]** The present invention relates to a box with a tissue dispenser used as a package of a large number of tissues made from cellulose material, made of one piece of flat material with a characteristic shape, with cuts, folds, opening to pull out the tissues and an internal tissue dispenser.

**[0002]** From the European Patent No. EP0286538 there is known a box comprising interlaced sheets and a sheet stacking method, wherein the stacked sheets can be pulled out of a box of cuboid or cube shape, there are holes in the upper walls of the box, with the shape similar to an ellipse or a circle, respectively.

**[0003]** From the German utility model DE202004005094 (U1) there is also known an ornamental box of paper tissues, consisting of a cubic bottom part and a cubic top part put on it, which has a central diamond-shaped opening made in it allowing the tissues to be pulled out of the box.

**[0004]** Packages in the form of folded boxes made from one blank are also known. Thus, the description of the Polish utility model W. 058301 discloses a box of one-piece cardboard blank, which has a rectangular top wall forming its base, joined along the edges of the fold with lateral walls comprising flaps. The lateral walls, located along the shorter edges of the bend of the base, have the rear outer flaps partially overlapping each other. The lateral walls have diagonal bevels in the corners and are connected with the inner rear flaps

**[0005]** From the description of the Polish utility model there is also known a box for storage, display and transport of products made from one blank, which is characterized by a rectangular, broader lateral wall with a rectangular cut with rounded corners, to which the narrower lateral walls with oval cuts adjoin along the longer edges. One of the narrower lateral walls is connected additionally to the other broader lateral wall and the second narrower lateral wall is provided with a lateral fastening tab in the shape of trapezium. The wider lateral wall has a rectangular bottom tab with a rectangular cut-out, while another wider lateral wall is fitted with a trapezoidal bottom tab with a rectangular tongue, wherein the width of the tongue is identical to the width of the cut-out. Narrower lateral walls are fitted with rectangular top tabs and reinforcing wings in the shape of two rectangular trapezoids joined by bases. Narrower lateral walls have rectangular cut-outs with two rounded corners and the incisions in the shape of three perpendicular sections joined by rounds.

**[0006]** There are commonly known boxes for tissues in the form of a cuboid or cube with an upper wall, with an elliptical cut-out in the middle thereof. The elliptical piece, during normal use, is pushed out, thus forming an elliptical opening under which there is the film cut along the large axis of the ellipse. The incision is used to pull out the tissues.

**[0007]** For the boxes available on the market and the

aforementioned one, mainly used to pack the cellulose tissues, to maintain their functionality a certain height cannot exceed, above which tissues can no longer be pulled out of the box, which is usually limited by the width of the folded tissue. In addition, many of them have polyethylene inserts that allow only one tissue to be pulled out of the box. The boxes after consuming the tissues contained therein, are thrown away and as waste paper they are most often transferred to the recovery of material for reuse for further processing. The polyethylene liner present therein significantly hinders the recycling process, because to maintain the quality of the cellulosic material - which could be used for further processing - it has to be removed since its retention will result in a reduction in the quality of the recovered material or completely eliminates the possibility of its recovery. Bearing in mind the above-mentioned disadvantages, the goal was set out to eliminate them by producing a box of useful properties as a package of cellulose tissues that allows packing a considerably greater number of tissues as that possible in the so far available packaging, by application of the tissue dispenser and optimal sheet blank, preferably folded to transport and forming an aesthetic form of product packaging as well as fit for simple recycling.

**[0008]** The essence of the invention is a box made of a cellulosic material, preferably a carton in the form of a single blank with a window, which allows the tissues to be slid one by one, which are arranged inside the box in the form of a stack so that pulling one of them causes the fragment of the next one to slide out, as well as comprising an internal tissue dispenser that allows a easy removal of even considerable number of tissues, which is composed of the dispenser shelve and ejector.

**[0009]** The box with the internal tissue dispenser consists of a rectangular bottom panel, constituting its base, which is connected along the right, longer creased edge with the left-lateral panel, and with the closing trapezoidal flaps with rectangular tongue along the shorter creased edges. The closing dust flaps in the rectangular shape with chamfered external corners, whose height is about half the height of the closing flaps the bottom panel, adjoin the left-lateral panel, along the shorter creased edges. There are rectangular-shaped stampings in the area of the closing dust flaps of the left-lateral panel, located on the right side of the closing dust flaps. The stampings are used to align the level the adhesive that connects the dust flaps with the closing flaps of the top panel.

**[0010]** The creasing edge connecting the bottom panel and the left-lateral panel is at the same time the symmetry axis of the ejector with the shape similar to a rectangular, whose two opposite sides, situated symmetrically in relation to each other, are respectively: in the plane of the bottom panel and the left-lateral panel and form the perforation lines, while the next two sides are the cut lines with the shape of the arch concave inwards.

**[0011]** The ejector also has centrally located three creasing lines parallel to each other arranged so that the outer creasing lines are symmetrical with respect to each

other and the axis of symmetry is the middle creasing line. Creasing lines do not connect with the perforation lines. The use of cut lines, creasing lines and perforation lines forming the shape of a tissue ejector according to the utility pattern results in such a formation of the ejector that allows it to be easily pushed inside the box during normal use. The ejector length, defined as the perforation line length, forms not less than 35% and no more than 45% of the length of the longer sides of panels, and the ejector width measured as the distance between the perforation lines forms not less than 35% and no more than 50% of the length of the longer sides of panels.

Depending on the thickness of the material used to make the box according to the utility model, the perforation lines can be replaced with the incision lines.

The top panel with the window forming the external tissue dispenser adjoins the left lateral panel along the longer, creased edge. The left, longer edge of the window forms a creasing line in the shape of an arc, and the right edge is a wavy line in the form of an axisymmetric sinusoid section, i.e. the sinusoid with a single central maximum and two local minima. In the process of preparing a flat semi-product to make a box according to the utility model (i.e. punching, cutting, creasing), the cutting of the wavy line takes place using the holding locks, i.e., the mini-notches on the wavy line of the cutter on the die, which results in keeping all the components of the window together. The components are separated along the cut line only by the pressure of the user's hand.

**[0012]** A pressed component in the shape of a circle sector, smaller or even to a semicircle with a diameter less than the middle maximum width, whose external lines are the cut lines is formed in the middle of the centre maximum of the cut line and on its left side. When the user presses the pressed component, a hole is formed that allows lifting the left part of the window from which the tissue or napkin is drawn. Shorter sides of the window are the cut lines, which connect to the creasing line on one side, while on the other side they pass beyond the cut line and curve archwise towards the inner side of the window. The sinusoidal cut line divides the window into two parts: the left, between the sinusoidal cut line and the creasing line, and the right formed between the sinusoidal cut line and the lateral cut lines with the archwise ends. Two portions of the window defined by a sinusoidal cut line form a convenient, external tissue dispenser. The use of creasing affects the left side of the window rises relative to the right side, while the lateral incisions of the right part of the window allow it to move freely up-down, under the influence of the hand pressure, causing the tissues to move. Thus, the shape of the cut line affects the way the tissues are laid and reduces the pressure on the deflecting part of the window, while the end of the lateral cut lines with the arcs also limits the possibility of tearing the material from which the box is made

**[0013]** The window length taken as the distance between the shorter sides, which are the cut lines, shall not be less than 70% and not more than 75% of the lateral

length of the longer wall of the top panel, wherein its width taken as the length of the shorter side, which is the cut line, shall be not less than 40% and not more than 45% of the length of the shorter wall of the top panel.

5 **[0014]** The right-lateral rectangular panel adjoins the top panel along the right, longer creased edge, while the trapezoidal closing dust flaps adhere to the top panel along the shorter creased edge, wherein the trapezoid side walls are slightly rounded at the top. The height of the closing dust flaps is half that of the closing flaps of the bottom panel and top panel; There are stampings in the shape of rectangles in the area of the closing dust flaps of the right lateral panel, situated on the left side of the closing dust flaps.

10 **[0015]** Next, the trapezoidal adhesive flap, the shorter base of which is the perforation line and is also the left side of the plane forming the shelf of the inner tissue dispenser, adjoins to the lateral right panel, along the right, longer creased line.

20 **[0016]** The dispenser shelf plane has a rectangular shape, whose left, longer side is the perforation line, and the remaining sides are the cut lines. The C-shaped cut line was performed with the length not less than 50% and not more than 55% of the length of the longer sides of the panels in the plane of the inner dispenser shelf, from the side constituting the perforation line. The cutting line joins from the two sides with perforation lines perpendicular to the sides of the plane of the dispenser shelf, whose distance from the perforation line, which is also the smaller base of the trapezoid forming the adhesive flap, is 50% of the width of the ejector. In the plane of the dispenser shelf, another perforation line was cut also, cutting through the two oval, cut-out holes. The distance of the second perforation line to the outer line is not less than 32% and no more than 36% of the length of the shorter sides of the lateral panel, and the distance from the creasing line, which at the same time is the greater base of the trapezoid constituting the adhesive flap, to the second line of perforation is equal to the length of the shorter sides of the bottom and top panel.

30 At the edge of the blank in the plane of the dispenser shelf, centrally between the two oval cut-outs there is an adhesive plane for gluing the dispenser shelf to the ejector plane just at the perforation line of the left side of the ejector. Perforated lines affect the appropriate arrangement of the shelf relative to the ejector.

40 **[0017]** Depending on the thickness of the material used to make the box according to the utility model, the perforation lines can be replaced with the incision lines.

50 **[0018]** Folding the box according to the invention starts with the folding of the adhesive flap integrated with the dispenser shelf along the longer right creasing line of the right lateral panel. Then, another portion of the blank composed of the bottom panel and the left lateral panel is folded along the creasing line connecting the top panel to the left lateral panel, . The adhesive flap is glued to the bottom panel and the dispenser shelf is glued to the ejector. Such folded semi-product is transported to the

tissue manufacturer, where it is filled with tissues, after which the remaining longer creasing lines are folded, and then the closing dust flaps and trapezoid closing flaps with rectangular tongue are folded along the shorter creasing lines, then the box is closed by gluing the trapezoid closing flaps to the closing dust flaps. The inner tissue dispenser formed by the ejector and the dispenser shelf is comprised inside the folded box, wherein the creasing line being at the same time the symmetry axis of the ejector coincides with the perforation line of the dispenser shelf with oval holes.

**[0019]** The user of the product pushes the semicircle-shaped pressed component to form a hole in the window and then lifts the left side of the window and pulls out the first tissue. The next tissues are fed through a dispenser made up of two portions of the window until the height of the remaining tissues is reduced so that the tissues cannot be pulled out. Then the ejector is pushed, which shifts the shelf attached to it, so that a higher level (shelf) is formed on which the tissues are laid, which can now be drawn freely out of the box.

**[0020]** The box of the invention, thanks to the construction of the external tissue dispenser, allows avoiding additional operations associated with gluing the film into the package, while the absence of the film allows the box to be easily recycled and, thanks to the use of an internal tissue dispenser, it allows one packaging to be filled at the same time with twice as many tissues that can be freely pulled out. The blank of the starting material sheet, from which the box is folded, makes it possible to transport it "flat", thus optimizing the transport conditions for a large number of packages occupying a relatively small area. In addition, the utility benefits of using a particular waveform in the form of an axial symmetrical sinusoid section are also obtained, as well as from the use of the special design of internal tissue dispenser. Now it is easy to open the box, tilt the window cover and pull out the tissue, as well as the number of tissues in a single packaging can be increased, while maintaining the ease of removing tissues.

**[0021]** The subject of the invention is shown in the drawing, in which Fig. 1 shows a box blank; Figure 2 shows a window made in the top panel of the box; fig. Figure 3 shows the tissue dispenser ejector, Fig. 4 shows the tissue dispenser shelf, Fig. 5 to Fig. 9 illustrate the sequential steps of producing a carton blank-based box, Fig. 10 shows the box with the pushed ejector and the tissue dispenser shelf.

**[0022]** The box with the internal tissue dispenser according to the utility model consists of a rectangular bottom panel 1, constituting its base, which is connected along the right, longer creased edge 2 with the left-lateral panel 3, and with the closing trapezoidal flaps 6 and 7 with rectangular tongue along the shorter creased edges 4 and 5. The closing dust flaps 10 and 11 in the rectangular shape with chamfered external corners, whose height is about half the height of the closing flaps 6, 7 of the bottom panel 1, adjoin the left-lateral rectangular pan-

el 3, along the shorter creased edges 8 and 9. There are rectangular-shaped stampings 12 and 13 in the area of the closing dust flaps 10 and 11 of the left-lateral panel 3, located on the right side of the closing dust flaps 10 and 11. The stampings 12 and 13 are used to align the level of adhesive that connects the closing dust flaps 10 and 11 with the closing flaps of the top panel 14 and 15.

**[0023]** The creasing edge 2 connecting the bottom panel 1 and the left lateral panel 3 simultaneously forms the symmetry axis for the ejector 16 of the internal tissue dispenser. The ejector 16 has a shape similar to rectangular, whose two opposing sides W1 and W2 are located symmetrically with respect to each other and respectively: the side W1 is in the plane of the bottom panel 1 and the side W2 in the plane of the left lateral panel 3. The sides W1 and W2 of the ejector 16 form perforated lines and the next two lateral sides W3 and W4 are the creasing lines with the shape of the arch concave inwards the ejector 16. Three creasing lines W51, W52 and W53 parallel to each other were made centrally inside the ejector 16 and so arranged that the outer creasing lines W51 and W53 are symmetrical with respect to each other and the axis of symmetry is the middle creasing line W52. Creasing lines W51, W52, W53 do not connect themselves with the perforation lines W1 and W2.

Depending on the thickness of the material used to make the box according to the utility model, the perforation lines can be replaced with the incision lines. The top panel along with the window 19 forming the outer tissue dispenser adjoins the left lateral panel 3, along the longer creased edge 17. The left, longer edge O1 of the window 19 forms an arcuate creasing, while the right edge O2 is a wavy line with the shape of an axial symmetrical sinusoid section. A pressed component O3 with the shape of a circle sector, smaller or even to a semicircle with a diameter less than the middle maximum width, whose outer lines are the cut lines, is formed in the middle of the right edge O2 on its left side. The shorter sides O4 of the window 19 are the cut lines that connect from one side to the creasing line O1 and go beyond the right edge O2 from the other side and arcuately curve towards the inner side of the window 19. The sinusoidal cutting line forming the right edge O2 of the window 19 divides the window 19 into two parts: the left **A**, contained between the sinusoidal cut line and the creasing line O1, and the right **B** formed between the sinusoidal cut line O2 and the lateral cut lines O4 with the arcuate ends.

The rectangular right lateral panel 21 adjoins to the top panel 18, along the longer creased edge 20, while the trapezoidal closing flaps 14 and 15 adjoin the top panel 18 along the shorter creased edges 22 and 23.

The rectangular closing dust flaps 26 and 27 with chamfered external corners, whose height is about half the height of the closing flaps 6 and 7 of the bottom panel 1 and the closing flaps 14, 15 of the top panel 18, adjoin the right-lateral panel 21, along the shorter creased edges 24 and 25. There are rectangular-shaped stampings 28 and 29 in the area of the closing dust flaps 26 and 27

of the right-lateral panel 21, located on the left side of the closing dust flaps 26 and 27. The stampings 28 and 29 are used to align the level the adhesive that connects the closing dust flaps 26 and 27 with the closing flaps of the top panel 14 and 15

**[0024]** Next, the trapezoidal adhesive flap 30, the shorter base 31 of which is the perforation line and is also the left side of the plane forming the shelf of the dispenser 32, adjoins to the lateral right panel 21, along the right, longer creasing line 29. The inner dispenser is formed by the ejector 16 and the shelf 32.

**[0025]** The dispenser shelf plane 32 has a rectangular shape, whose left, longer side 31 is the perforation line, and the remaining sides 32, 33 and 34 are the creasing lines. In the plane of the inner dispenser shelf 32, a C-shaped cut line P1 was formed from the outer side constituting the perforation line 31. The cutting line P1 connects from two sides with perforation lines P2, perpendicular to the sides 33, 35 of the plane of the dispenser shelf 32. The distance from the perforation line (31) to the perforation line (P2) is not less than 48% and no greater than 52% of the width of the ejector 16. In the plane of the dispenser shelf 32, another perforation line P3 was made also, cutting through the two oval, cut-out holes P4. There is an adhesive plane P5 from the side 34, in the plane of the dispenser shelf 32, centrally between the two oval cut-outs P4, which is used for gluing the dispenser shelf 32 to the ejector 16 plane just at the perforation line W1 of the ejector 16.

**[0026]** Folding the box according to the invention starts with the folding of the adhesive flap 30 integrated with the dispenser shelf 32 along the longer, right creasing line 29 of the right lateral panel 21. Then, another portion of the blank composed of the bottom panel 1 and the left lateral panel 3 is folded along the creasing line 17 connecting the top panel 18 to the left lateral panel 3. The adhesive flap 30 is connected with the bottom panel 1 and the dispenser shelf 32 is connected to the ejector 16. Such folded semi-product is transported to the tissue manufacturer, where it is filled with tissues, after which the remaining longer creasing lines 2 and 20 are folded, and then the closing dust flaps 10, 11, 26 and 27 and trapezoid closing flaps 6 and 7 with rectangular tongue are folded along the shorter creasing lines 8, 9, 24 and 25, then the box is closed by gluing the trapezoid closing flaps 14 and 15 to the closing dust flaps 1, 11, 26 and 27. The inner tissue dispenser formed by the ejector 16 and the dispenser shelves 32 is comprised inside the folded box, wherein the creasing line 2 being at the same time the symmetry axis of the ejector 16 coincides with the perforation line P3 with the oval holes P4 of the dispenser shelf 32.

The user of the product pushes the semi-circle-shaped pressed component 03 to form a hole in the window and then lifts the left side A of the window 19 and pulls out the first tissue. The next tissues are fed through a dispenser made up of two portions A and B of the window 19 until the height of the remaining tissues is reduced so

that the tissues cannot be pulled out. Then the ejector 16 is pushed, which shifts the shelf 32 glued to it, so that a higher level (shelf) is formed on which the tissues lay, which can now be drawn freely out of the box.

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## Claims

1. The box with a tissue dispenser composed of respective items connected along the creasing line (2,17,20); the bottom panel (1) with the closing flaps (6, 7) adjoining along the shorter creased lines (4, 5), the left lateral panel (3) with the closing-dust-flaps (10, 11) adjoining along its shorter creased lines (8, 9), the top panel (18) with closing flaps (14, 15) adjoining along the shorter creased lines (22, 23), lateral right panel (21) with closing dust flaps (26, 27) adjoining along the shorter creased lines (24, 25) **characterized in that** it has:

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- an outer tissue dispenser that is the window (19), contained in the top panel (18), whose left edge is an arc-shaped creasing curve (O1) with the shape of the arc convex towards the creasing line (17), and the right edge is a wavy cut line (O2) with the shape of sinusoid section with one centre maximum and two side minima, wherein there is a pressed component (O3) with the shape of the circle section less than or equal to semicircle with the diameter less than the width of the centre maximum, but shorter edges of the window (19) are the straight cut lines (O4), which from one side connect to the archwise creasing line (O1) and from the other go beyond the sinusoidal cut line (OL2) and archwise curve into the inner side of the window (19).

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- an inner tissue dispenser that is formed by the ejector (16) and the dispenser shelf (32)

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2. Box with a tissue dispenser according to the claim 1, **characterized in that** the window (19) constituting the tissue dispenser is centred on the surface of the top panel (18) and its length taken as a distance between the lines of straight cuts (OL4) is not less than 70% and not more than 75% of the length of the top panel (18) and its width taken as the length of the straight cut line (OL4) is not less than 40% and not more than 45% of the width of the top panel (18).

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3. Box with a tissue dispenser according to the claim 1 or 2, **characterized in that** the ejector (16) has two opposing sides (W1, W2), arranged symmetrically with respect to each other and situated respectively: the side (W1) in the plane of the bottom panel (1) and the side (W2) in the plane of the left lateral panel (3), wherein the sides (W1, W2) of the ejector (16) form perforation lines, the two next sides (W3, W4) are creases with the shape of the arch concave to-

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wards the ejector (16), while there are three centrally aligned, parallel to each other, creasing lines (W51, W52, W53) inside the ejector (16), arranged so that external creasing lines (W51, W53) are symmetrical with respect to each other and the axis of symmetry is the middle crease line (W52). 5

4. Box with a tissue dispenser according to the claim 3, **characterized in that** the ejector (16) length, defined as the length of the sides (W1 and W2) is not less than 35% and no more than 45% of the length of the longer sides (2, 14, 18, 27) of the panels (1, 3, 15, 19), and the ejector (16) width measured as the distance between the sides (W1, W2) is not less than 35% and no more than 50% of the length of the longer sides (2, 14, 18, 27) of the panels (1, 3, 15, 19). 10  
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5. Box with the tissue dispenser according to any one of the preceding claims from 1 to 4, **characterized in that** the shelf of the dispenser (32) has the rectangular shape, which left longer side (31) is the perforation line, while the remaining sides (33, 34, 35) are the cut lines, while there is a cut line (P1) of a c shape that connects from two sides with the perforation lines (P2) perpendicular to the sides (33, 35) in the shelf plane of the dispenser (32) from the side of the perforation line (31) and there is a perforation line (P3) from the side (34), intersecting two oval, cut-out holes (P4). 20  
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6. Box with a tissue dispenser according to the claim 5, **characterized in that** the distance from the perforation line (P3) to the side (34) is not less than 32% and not more than 36% of the length of the shorter sides (8, 9, 24, 25) of the side panels (3, 21) and the distance from the creasing line (29) to the perforation line (P3) is equal to the length of the shorter sides (4, 5, 22, 23) of the panels (1, 18). 35
7. Box with a tissue dispenser according to the claim 5 or 6, **characterized in that** the length of the cutting line (P1) is 55% of the length of the longer sides (2, 14, 18, 27) of the panels (1, 3, 15, 19). 40
8. Box with a tissue dispenser according to any one of the preceding claims from 1 to 7, **characterized in that** the distance from the perforation line (31) to the perforation line (P2) is equal to not less than 48% and not more than 52% of the width of the ejector (16). 45  
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9. Box with a tissue dispenser according to any one of the preceding claims from 1 to 8, **characterized in that** the perforation lines (31, W1, W2, P2, P3) can be replaced by the incision lines. 55

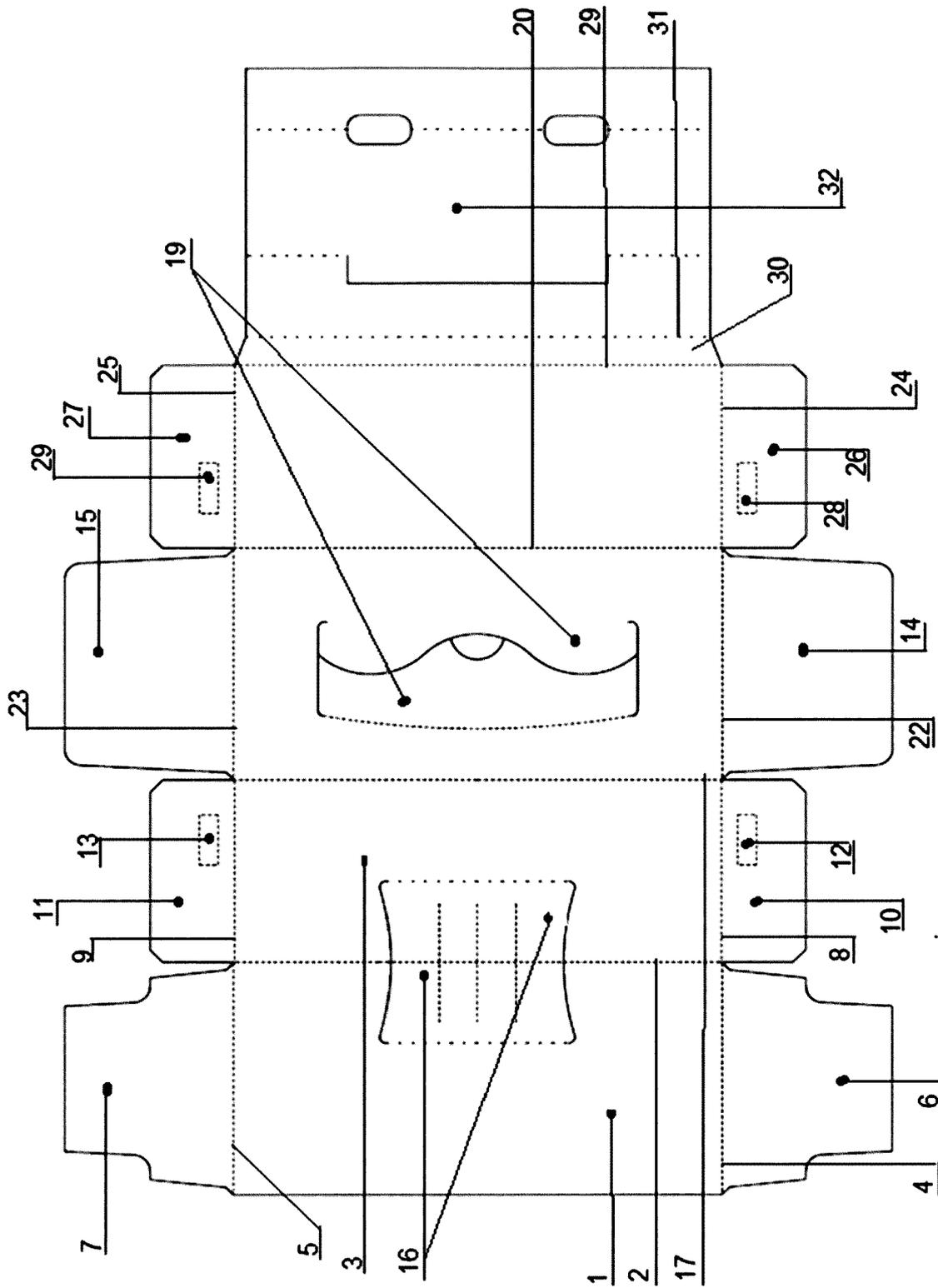


Fig.1

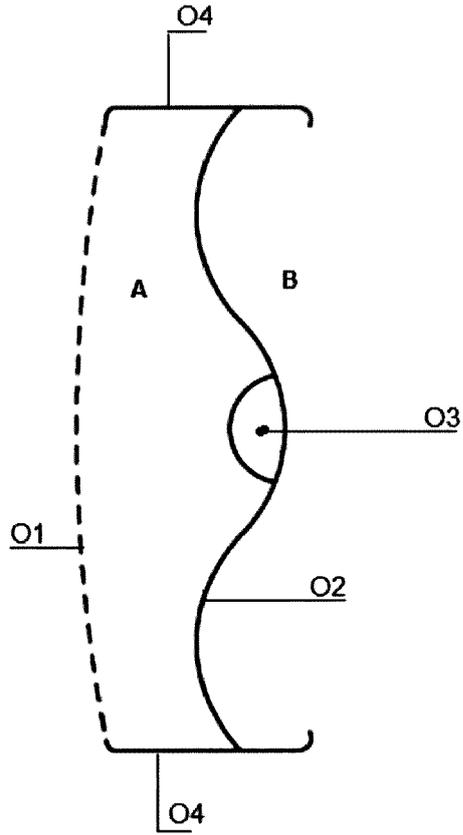


Fig.2

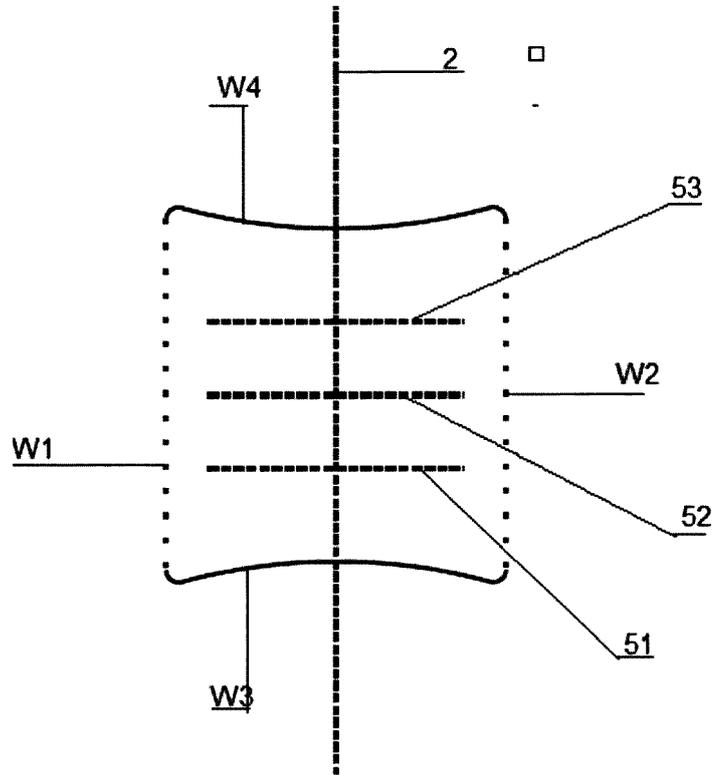


Fig.3

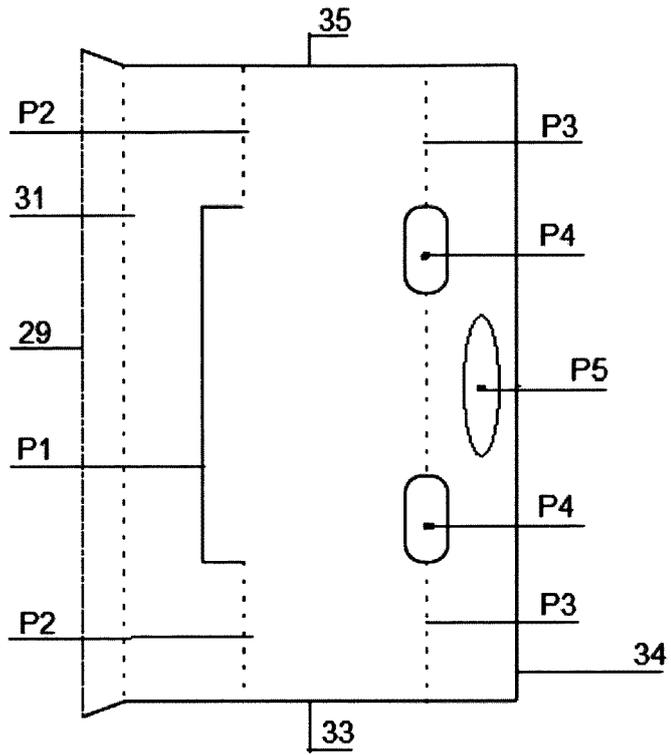


Fig.4

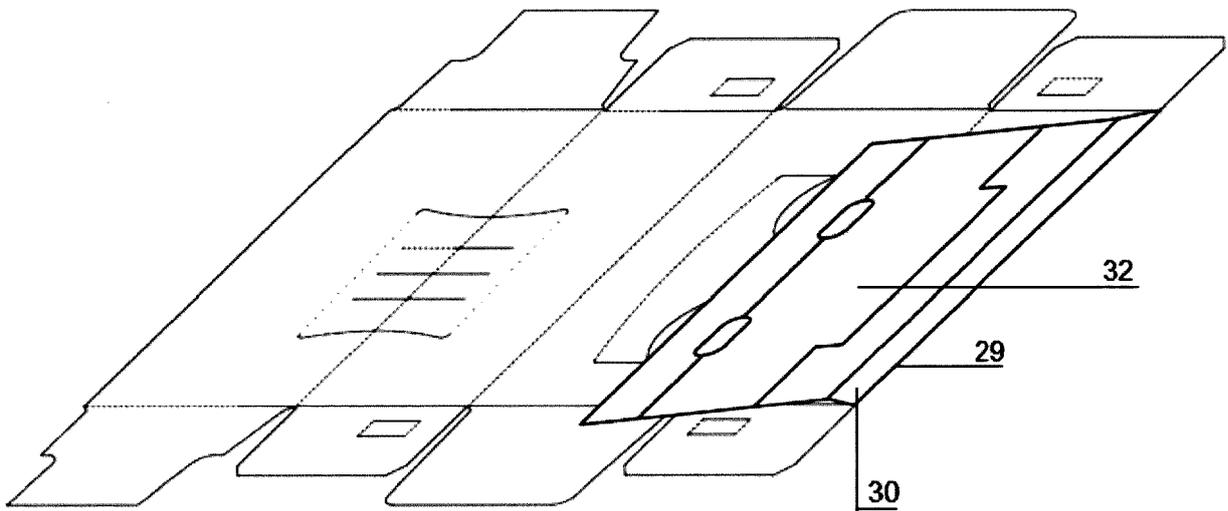


Fig.5

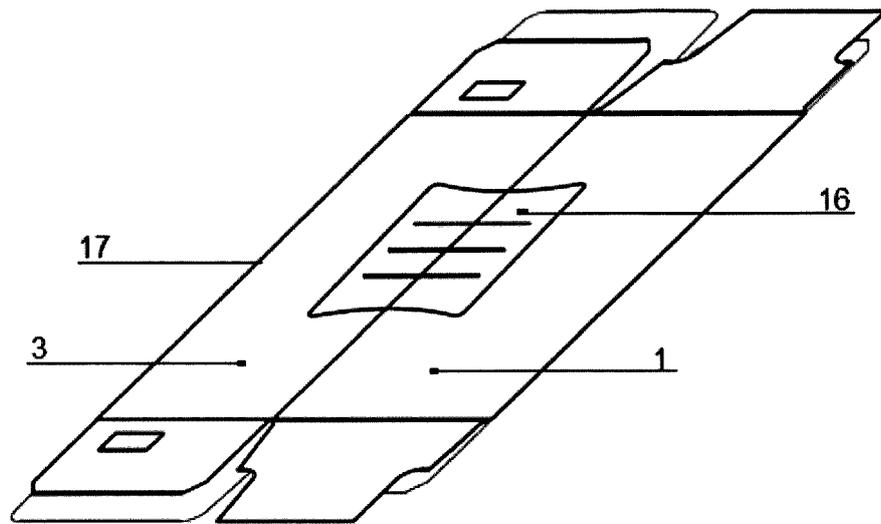


Fig.6

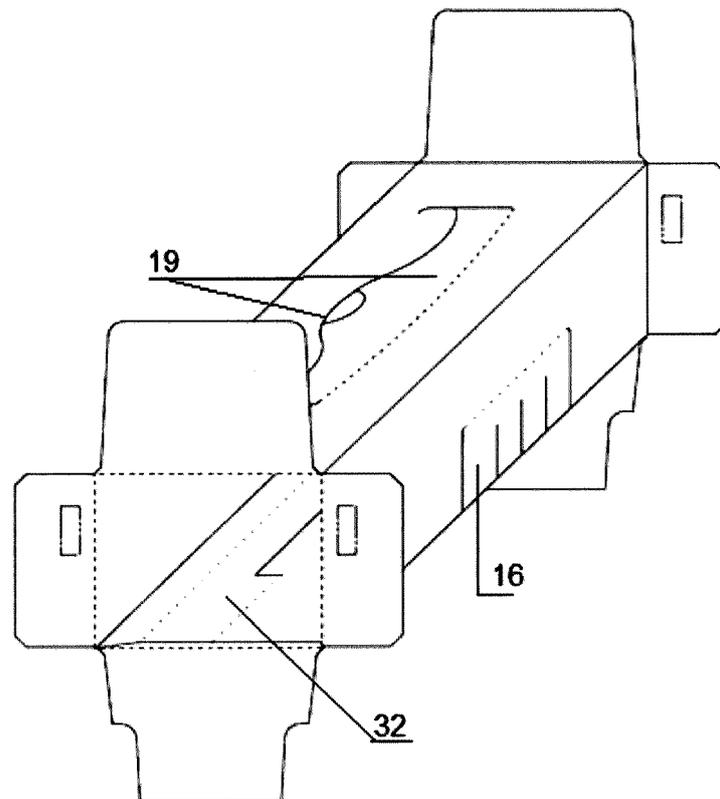


Fig.7

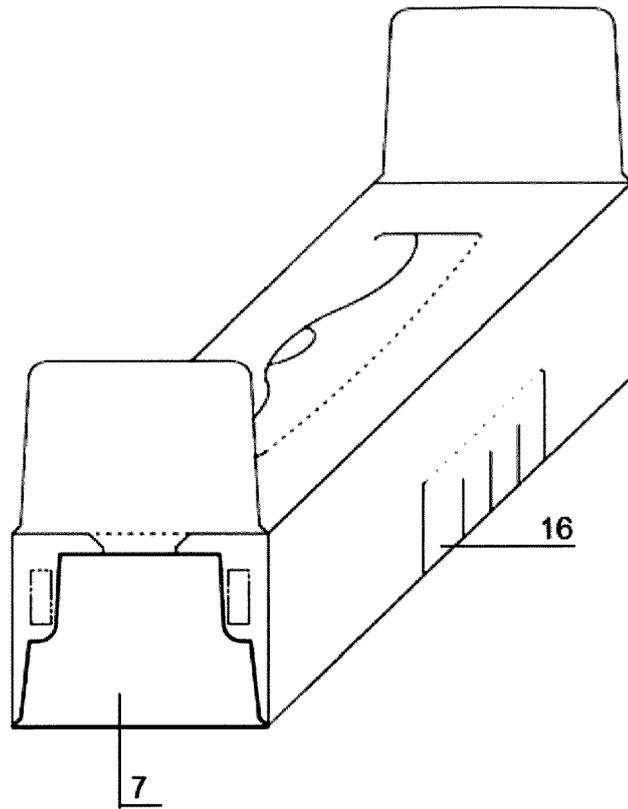


Fig.8

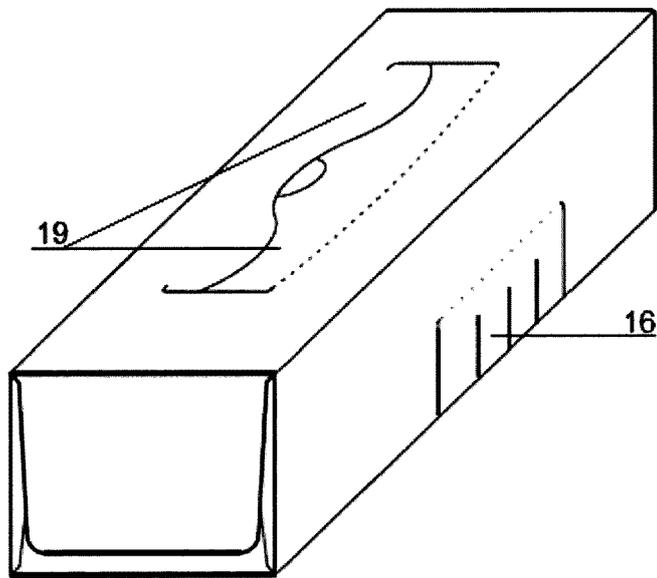


Fig.9

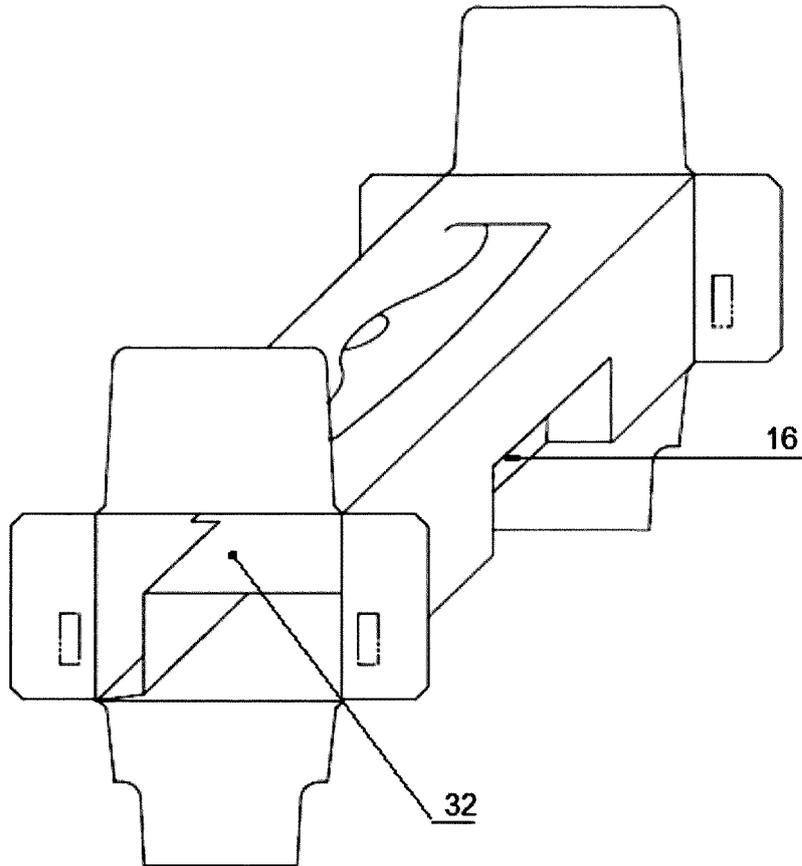


Fig.10



EUROPEAN SEARCH REPORT

Application Number  
EP 17 46 0052

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 2 636 599 A (WILLIS CECIL H ET AL) 28 April 1953 (1953-04-28) * column 2, line 14 - column 3, line 28; figures 1-11 *	1	INV. B65D83/08
A	WO 01/53169 A1 (LEIGHTON DANIEL [AU]; LEIGHTON ANGELA MARY [AU]) 26 July 2001 (2001-07-26) * page 3, line 20 - page 4, line 27; figures 1-7 *	1	
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			B65D
The present search report has been drawn up for all claims			
Place of search <b>Munich</b>		Date of completion of the search <b>20 March 2018</b>	Examiner <b>Grondin, David</b>
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 O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

**REFERENCES CITED IN THE DESCRIPTION**

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