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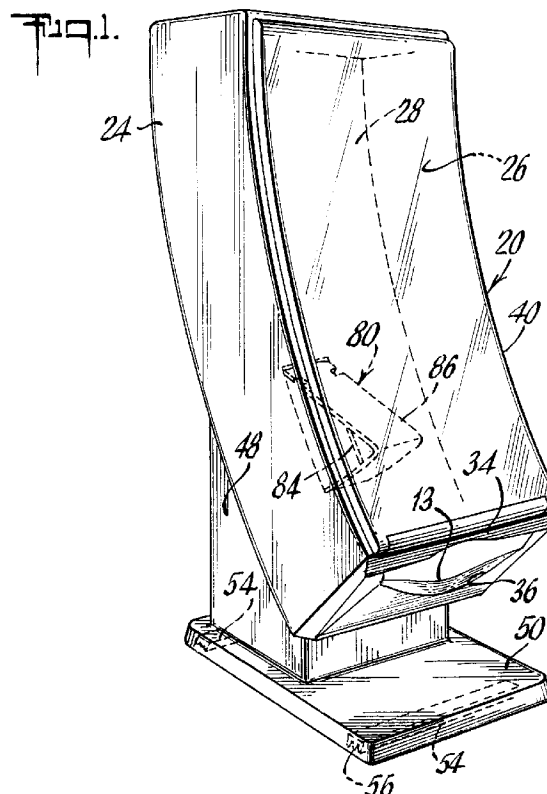
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Folded sheet product dispenser system.

A dispenser apparatus (20) for serially dispensing paper napkins or similar sheet products (10) from a stack (S) of such products comprising a housing having a curved back wall (18) and a nose piece (34) with an opening therein for dispensing said sheets. The nose piece includes two pairs of contact surfaces (44, 46, and 60, 62) arranged to subject the lowermost sheet to two sequential bending forces applied to said sheet at right angles to one another. During the bending, a flap terminal end (13) of the lowermost sheet is unsupported by the nose piece (34) over its central area. Bending of the folded sheet product urges the flap terminal end (13) outwardly away from the rest of the sheets in the stack to facilitate grasping and removal of the lowermost sheet. A blocking member (80) may also be provided which obstructs the interior of the housing above the stack after the stack has shortened to a predetermined level preventing upward movement of the sheets remaining in the stack.



Technical Field

This invention relates to dispenser apparatus for serially dispensing discrete folded sheet products, for example, paper napkins, from a stack of said folded sheet products. In one specific embodiment, the dispenser apparatus includes a housing of specified construction which provides for improved presentation of the products at the point of dispensing, facilitates such dispensing, and utilizes storage space in a highly efficient manner.

Background Art

It is well known to serially dispense folded sheet products, for example, paper napkins, from a stack of such products. Such dispensers can employ followers or simply be gravity fed, the latter approach generally being the lowest in cost and the least complex.

In gravity-fed dispensers for paper napkins and the like, the products are stacked in a housing having an opening, or a dispenser element or nose piece defining an opening, at the lower end of the housing through which the products are dispensed in a serial fashion by manual removal of the lowermost sheet product from the opening.

It will be appreciated that dispensing of the lowermost napkin or other folded sheet product can be inhibited by frictional forces exerted thereon by the rest of the stack. That is, the lowermost folded sheet product supports the rest of the stack. The higher the stack, the greater the frictional forces between the lowermost folded sheet product and the folded sheet product immediately adjacent thereto. Ripping and tearing of the napkin or other folded sheet product being dispensed is fairly common, particularly when the stack itself is quite long and the lowermost folded sheet product bears its entire weight.

Often, the paper napkins and other similar products are disposed in the dispenser essentially horizontally, so that the paper napkin or other folded sheet product being dispensed bears the full load of the vertical stack of which it is a part. In such dispensers, the consumer may have difficulty accessing and withdrawing the lowermost paper napkin or the like.

The products being dispensed, for example, paper napkins, are often of non-uniform thickness due to the particular fold utilized in their construction. A stack of such folded sheet products will tend to be higher at one side thereof than at the other due to the non-uniform thickness of each individual product. To accommodate a straight, vertically disposed stack, a dispenser housing of the prior art must be as high as the highest side of the stack. Additionally, frictional engagement between folded sheets at the opening from the dispenser is non-uniform, often resulting in tearing of the sheet as it is withdrawn from the dispenser.

DISCLOSURE OF THE INVENTION

The dispenser apparatus of the present invention is so constructed as to relieve and evenly distribute frictional forces of folded sheet products at the bottom of a stack of such products. Additionally, the dispenser may be so constructed as to present the edge of the lowermost folded sheet product in the stack toward the consumer to facilitate manual access to and removal of the lowermost sheet product.

The dispenser apparatus of the present invention is particularly adapted to dispense folded sheet products of non-uniform thickness having a first edge portion thereof thicker than a second edge portion thereof. The folded sheet products, when stacked with the first edge portions and second edge portions in respective alignment, and in the absence of outside forces applied thereto, form a stack with a bend along the length thereof having a predetermined radius of curvature.

The present invention provides a dispenser apparatus for serially dispensing discrete folded sheet products from a stack of said folded sheet products, each of said folded sheet products being of non-uniform thickness and having a first edge portion thereof thicker than a second edge portion thereof whereby said folded sheet products when stacked with the first edge portions and second edge portions in respective alignment and in the absence of outside forces applied thereto form a curved stack, said dispenser apparatus comprising a housing including a back wall, a front wall, and side walls defining an interior for accommodating a stack of said folded sheet products, said housing back wall being curved to accommodate the curvature of said stack; an opening at the lower end of said housing in communication with said housing interior permitting manual access to and removal of the lowermost folded sheet product in the stack thereof in said housing, the curved housing back wall permitting the said first edge portions of the stacked folded sheet products to slide over said wall during downward movement of said stack within said housing interior upon removal of the lowermost folded sheet product therefrom.

The housing back wall may be vertically oriented at its upper end and extend forward at its lower end. The opening at the lower end of the dispenser apparatus may be generally disposed along a plane substantially perpendicular to the back wall of the housing at its lower end such that the bottom of the lowermost folded sheet product in the housing faces towards the consumer to facilitate manual access to the lowermost sheet product through the opening.

A specific embodiment of this invention comprises an improved nose piece defining an opening through which folded sheet products are dispensed from a stack contained in the housing.

In other specific embodiments of the present in-

vention, the dispenser apparatus includes improved means for supporting the housing, and a blocking device associated with the housing to prevent upward movement of the products when the level falls below a predetermined height.

Brief Description of Drawings

Fig. 1 is a perspective view of a preferred form of dispenser apparatus constructed in accordance with the teachings of the present invention;
 Fig. 2 is a cross-sectional, side view of the dispenser with a stack of paper napkins therein;
 Fig. 3 is a diagrammatic view of a representative folded napkin of the type suitable for dispensing by the dispenser apparatus;
 Fig. 4 is a diagrammatic, profile view illustrating the configuration assumed by a stack of paper napkins of the type illustrated in Fig. 3;
 Fig. 5 is a perspective view of the supply side of a nose piece for a dispenser of the type illustrated in Fig. 1;
 Fig. 6 is a cross-sectional view taken along the line 6-6 of Fig. 5;
 Fig. 7 is a cross-sectional view taken along the line 7-7 of Fig. 5;
 Fig. 8 is a perspective view of a folded napkin of the type illustrated in Fig. 3, illustrating its configuration when protruding from the nose piece.

Best Mode For Carrying Out The Invention

Fig. 3 illustrates diagrammatically a typical folded sheet product of the type to be dispensed by the dispenser apparatus of the present invention. The illustrated folded sheet product is a paper napkin 10. Napkin 10 is, as may clearly be seen, of non-uniform thickness having a first edge portion 12 thereof, thicker than a second edge portion 14 thereof. This uneven thickness results from the nature of the fold.

When paper napkin 10 is stacked with other paper napkins of like construction in a dispenser housing, it is usually necessary, or at least desirable, to have the first edge portions and second edge portions of all of the stacked napkins in respective alignment. These stacked napkins will, in the absence of outside forces being applied thereto, form a curved stack S, as shown in Fig. 4.

With reference to Figs. 1 and 2, the dispenser apparatus of the present invention includes a generally vertically oriented housing 20 having a front cover 40, side walls 24, 26 and a back wall 28 defining an interior for accommodating a stack S of paper napkins. The housing back wall 28 is smoothly curved and has a radius of curvature generally corresponding to the normal radius of curvature of the stack S shown in Fig. 4.

In a Preferred embodiment of this invention, a

nose piece 34 defining an opening 36 in communication with the housing interior is provided at the lower end 23 of the housing 20. A preferred nose piece 34 is illustrated in greater detail in Figs. 5, 6 and 7. Opening 36, in nose piece 34, in communication with the interior of housing 20, allows manual access to and removal of the lowermost folded sheet product in the stack S of folded sheet products in the housing 20.

The first edge portions 12 of the paper napkin 10 stacked in housing 20 are in free slidable engagement with the smoothly curved housing back wall 28. Housing back wall 28 is generally vertically oriented at the upper end 22 of the housing and extends forward at the lower end 23 of the housing 20.

The dispenser nose piece opening 36 is disposed along a plane substantially perpendicular to the housing back wall 28 at the lower end 23 of the housing 20. Thus, the bottom edge 13 of the lowermost folded sheet product in the housing faces toward the front of the dispenser, i.e. in the direction of the consumer, to facilitate manual access of the lowermost sheet product through the opening. Some of the weight of the stack S in the vicinity of the nose piece 34 is carried by the lower end of the back wall 28. The lowermost napkin therefore does not carry the entire weight of the stack, and the frictional forces between it and the paper napkin immediately above it are significantly less than that in a conventional vertical stack. Similarly, less friction exists between the lowermost paper napkin and the nose piece 34. Thus, a consumer will encounter considerably less resistance in pulling the lowermost napkin from the stack through the opening 36.

The front cover 40 is hinged to the housing 20 in a suitable manner as by hinge 42. The cover 40 is curved and generally parallel to the housing back wall 28 when in the closed position illustrated in solid line in Fig. 2. The phantom line presentation illustrates schematically how the cover 40 may be pivoted outward to expose the housing interior for refilling or servicing the dispenser.

The embodiment of the dispenser includes a support stand 48 connected to the housing 20 and supporting the housing above a horizontal support surface. The base 52 of the support stand 48 is provided with support elements 54 of a resilient flexible material, for example, rubber, which project outwardly from the base of the support stand. The illustrated support elements are elongated, extending from one side of the support stand to the other side thereof.

Each support element 54 includes a plurality of flexible, elongated ribbed strips 56 disposed side-by-side and parallel to one another, as illustrated in Fig. 1. Each ribbed strip 54 has a plurality of parallel elongated distal rib elements 56. The rib elements 56 are bent when positioned on a support surface 57 establishing frictional engagement between the support surface and the side walls of each rib 56. The rib ele-

ments 56 are highly effective in preventing movement of the dispenser on the support surface. The ribbed strips 56 are markedly superior to pads or flat feet often utilized in, for example, paper napkin dispensers.

A nose piece 34 (Figs. 1 and 2) is connected to the lower end 23 of housing 20 and has an opening 36 therein communicating with the housing interior through which paper napkins are dispensed from the stack S in serial fashion.

As illustrated in Figs. 5-7, nose piece 34 has a front side 35 and a back side 37, the back side facing toward and engageable by the stack S of paper napkins in the interior of housing 20. The front of the nose piece 34 forms the external surface of the bottom of housing 20. In this illustrated preferred embodiment, the nose piece 34 is of unitary construction and may be, for example, comprised of plastic which has been molded or otherwise formed in a conventional manner.

With reference to Figs. 5-7, nose piece 34 includes a pair of smooth, inclined first contact surfaces 44, 46 spaced from one another and defining smooth slopes on the back side of the nose piece leading to opening 36. These first contact surfaces 44, 46 lead from a first pair of opposed housing walls, i.e. back wall 28 and front wall 40 at the back of the housing, and gradually converge toward one another and toward the front 35 of the nose piece, terminating at opening 36.

The back side of nose piece 34 also includes a pair of inclined second contact surfaces 60, 62 which are spaced from one another leading from a second pair of opposed housing side walls, namely side walls 24 and 26, and gradually converge toward one another and toward the front 35 of the nose piece, and terminating at the opening 36.

It is important that the first contact surfaces 44 and 46 project toward the opening 36 a greater distance than do the second contact surfaces 60 and 62. The first and second contact surfaces are contiguous and form a generally continuous, smoothly curved surface about the periphery of the opening 36 leading from the back 37 to the front 35 of the nose piece as illustrated.

The nose piece 34 includes a flange 51. When the nose piece is in position relative to the housing, the distal ends of at least some of the housing walls are covered by the flange and at least some of the walls engage nose piece contact elements. The relationship between the nose piece and wall 24 and its opposing side wall 26 is shown in dashed lines in Fig. 7.

It will be appreciated that the stack of paper napkins within the housing interior is biased toward the nose piece. A mechanical biasing arrangement (not shown), for example, a follower plate biased by a spring or a weight, may be utilized to urge the stack toward the nose piece.

The first contact surfaces 44 and 46 are engageable by the end-most paper napkin of the stack positioned at the discharge end of the housing closely adjacent the first side edges thereof. Movement of the stack after initial engagement with the first contact elements causes the first side edges 12 of the end-most paper napkin to slide along first contact surfaces 44, 46 and create a bend in the end-most paper napkin about an axis Y-Y generally parallel to the first contact elements, as illustrated in Fig. 8. The end 13 of the napkin is unsupported and out of engagement with the first contact surfaces 44 and 46. Terminal end flap 13 is thus free to move away from remainder of the paper napkin to some degree.

Initial engagement between the first contact surfaces 44, 46 and the end-most paper napkin occurs generally along the plane designated by the letter A in Figs. 6 and 7.

The end-most paper napkin also engages the second contact surfaces 60, 62 closely adjacent to the second side edges 64, 66 of the end-most napkin which serve to bend the end-most paper napkin about axis X-X which is generally parallel to the second contact surfaces 60, 62. Engagement with the pair of second contact elements takes place generally at the level of plane B shown in Figs. 6 and 7 relative to the nose piece 34.

Second contact surfaces 60, 62 are so configured and relatively positioned as to engage only the opposed extremities of the terminal end of flap 13. The flap terminal end otherwise does not engage the nose piece, being in registry with an area of maximum opening width 70 where the opening 36 flares out from a semi-circular shaped opening area 72 immediately adjacent thereto.

The result of the compound bending of the end-most paper napkin 10 and the sliding of the second side edges 64 of the napkin on second contact surfaces 64, 66 while the flap terminal end 13 is supported only at the opposite extremities thereof, forcing the intermediate portion of the flap terminal 13 outwardly of the rest of the napkin in the manner illustrated in somewhat diagrammatic fashion in Figs. 1 and 2. A consumer can now readily grasp the flap terminal end 13 and withdraw the paper napkin outwardly through opening 36. The smoothly curved surfaces 44, 46, 60, 62 defining the opening 36 greatly facilitate such removal by reducing frictional forces between the nose piece 34 and the lowermost napkin. First contact element 42 has an area of reduced thickness 72 at a location spaced from the flap terminal 13 to further facilitate manual grasping of the flap terminal and removal of a napkin by a consumer.

A further specific embodiment of the dispenser includes blocking means operatively associated with the housing and responsive to shortening of the stack of folded sheet products during depletion thereof to a predetermined stack length. The blocking means, de-

scribed in detail hereinafter, restricts upward movement of the stack within the housing interior.

As illustrated in Figs. 1 and 2, a blocking means 80 may be operatively associated with the housing 20 and responsive to shortening of the stack S of folded sheet products during depletion thereof. When the napkins are dispensed to a predetermined stack length, the blocking means 80 restricts upward movement of the stack S within the housing interior. In a preferred embodiment, the blocking means includes a flap 86 movably mounted relative to the housing and movable between a first retracted position (the position illustrated in phantom outline in Fig. 1) wherein the blocking member does not interfere with the movement of the stack within the housing interior and a second position (shown in Figs. 1 and 2) wherein the blocking member projects into the housing interior.

In this specific embodiment, an aperture or opening 84 is provided in back wall 28 of the dispenser housing and the blocking member 80 passes through the aperture 84 in moving between the first and second positions. The flap 86 of blocking member 80 is pivotally connected to the back wall 28 of the dispenser a predetermined distance above the nose piece 34. A hinge pin 88 is connected to the housing wall 28 in any suitable manner and extends across the top of aperture 84. At its upper end, flap 86 of blocking member 80 is curled about hinge pin 88 to provide a hinged connection between the blocking member and the housing. The blocking member 80 is thus freely rotatable about hinge pin 88.

The blocking member 80 is biased toward the second position as shown in Fig. 2. In this embodiment, the biasing means is in the form of a counterweight 90 extending outwardly from pin 88 on the side thereof opposite blocking member 80. The counterweight 90 may be formed of any suitable material, such as lead or steel, and under the influence of gravity urges the blocking member 80 toward the position illustrated in Fig. 2.

It will be appreciated that blocking member 80 is maintained in its retracted first position illustrated in phantom lines in Fig. 2 by the stack S of paper napkins until the stack diminishes in length to the point where the topmost napkin falls below the lower end of blocking member 80. That is, blocking member 80 can move to its second position under the influence of counterweight 90 only after the length of the stack falls below the level of the bottom 92 of the blocking member. When the length of the stack shrinks to the required height, the blocking member rotates so that it is disposed over the stack. The bottom 92 of the blocking member 80 will thus interfere with and prevent significant upward movement of the paper napkins remaining in the stack. If an upwardly directed force is applied to the lowermost paper napkin, the stack cannot be significantly dislodged from its dispensing position within the housing and relative to the

dispenser opening.

As illustrated in Fig. 2, a protrusion or lip 94 projects from the distal end of blocking member bottom 92. Such protrusion is engageable with the wall 28 where the wall defines the lower limit of aperture 84. Such engagement ensures that the counterweight 90 will not cause the blocking member 80 to extend any farther into the interior of housing 20 than is desired.

The blocking member 80 will not interfere with napkin reloading nor is it necessary for the person performing the reloading activity to take any special steps to retract the blocking member from the housing interior. The blocking member is retracted automatically by the napkins themselves during the refill operation. That is, the refill napkins will bear against the blocking member and cause the blocking member to swing back to the position shown in phantom outline in Fig. 2, against the bias of the counterweight 90.

Claims

1. Dispenser apparatus for serially dispensing discrete folded sheet products (10), from a stack (S) of said folded sheet products, each of said folded sheet products (10) being of non-uniform thickness and having a first edge portion (12) thereof thicker than a second edge portion (14) thereof whereby said folded sheet products when stacked with the first edge portions and second edge portions in respective alignment and in the absence of outside forces applied thereto form a curved stack, said dispenser apparatus comprising a housing (20) including a back wall (18), a front wall (40), and side walls (24, 26) defining an interior for accommodating a stack (S) of said folded sheet products (10), said housing back wall (18) being curved to accommodate the curvature of said stack (S); an opening (36) at the lower end of said housing in communication with said housing interior permitting manual access to and removal of the lowermost folded sheet product (10) in the stack (S) thereof in said housing (20), the curved housing back wall (18) permitting the said first edge portions (12) of the stacked folded sheet products to slide over said wall during downward movement of said stack within said housing interior upon removal of the lowermost folded sheet product therefrom.
2. A dispenser apparatus according to Claim 1, wherein said housing back wall (18) is essentially vertically oriented at the upper end (22) of said housing and extends forward at the lower end (23) of the housing.
3. A dispenser apparatus according to either of Claims 2 or 3, wherein said opening (36) is gen-

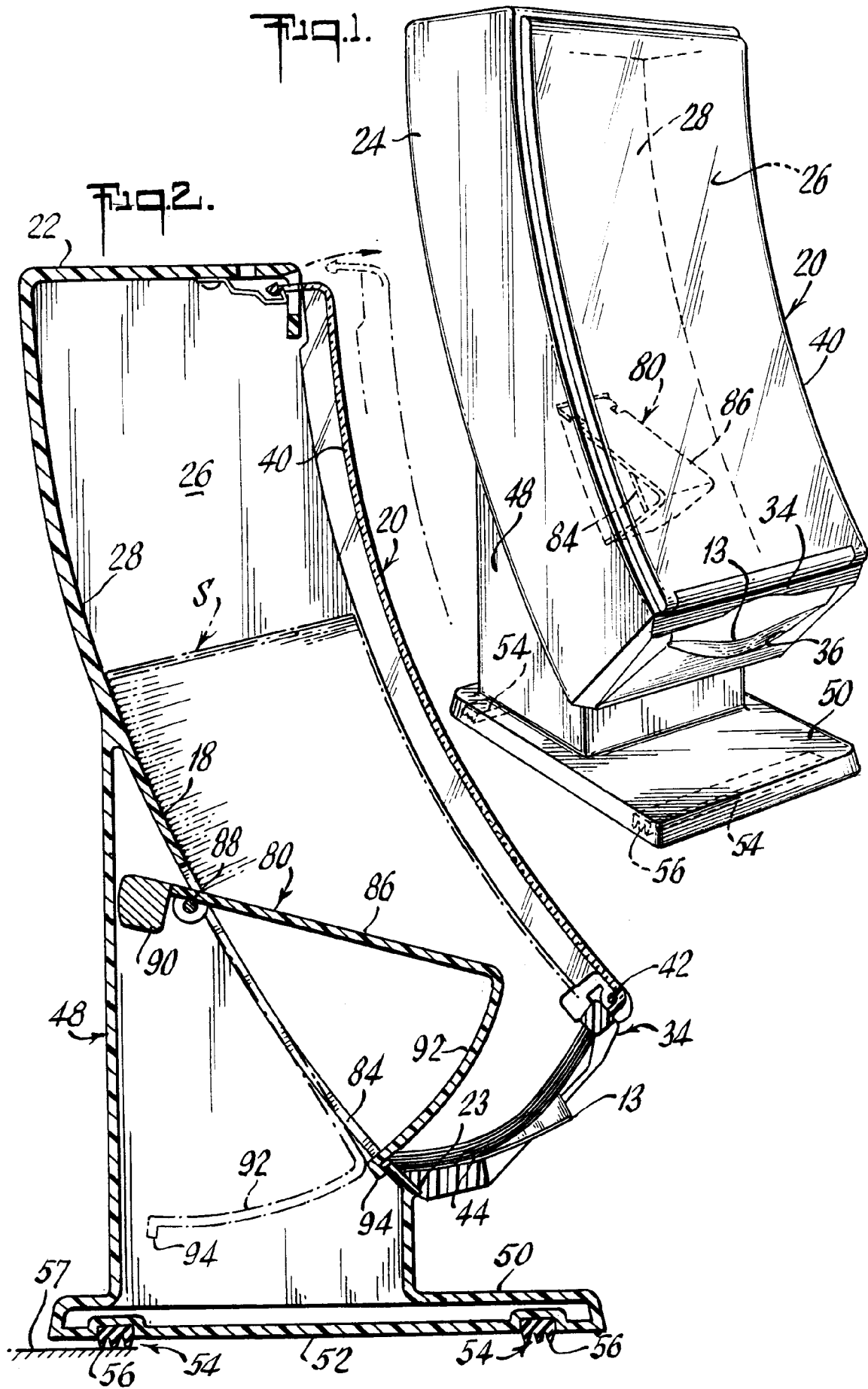
erally disposed along a plane substantially perpendicular to said housing back wall (18) at the lower end (23) of the housing.

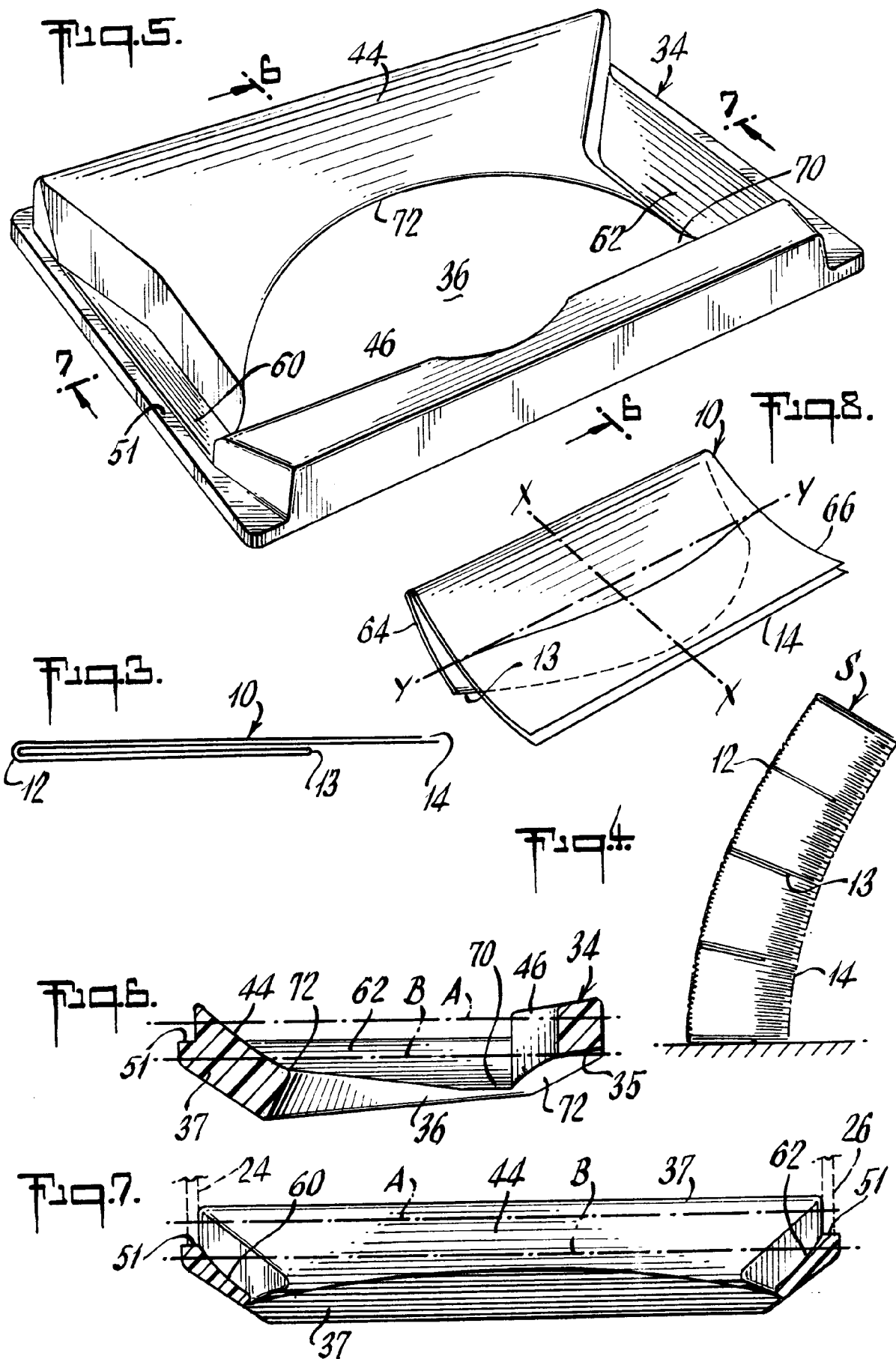
4. A dispenser apparatus according to any of Claims 1 to 3, additionally comprising a front wall (40) pivotally connected to the side walls (24, 26) of said housing. 5
5. A dispenser apparatus according to any of Claims 1 to 4, additionally comprising a support (48) for supporting said housing and a support surface, said support (48) including a base (50) and at least one support element (54) projecting downwardly from said support base, said support element including a plurality of flexible, elongated rib elements (56). 10 15
6. A dispenser according to any of the preceding claims wherein said opening (36) is defined by a nose piece (34) including a pair of inclined contact surfaces (44, 46), said contact surfaces leading from a first pair of opposed housing walls (18, 40) and gradually converging toward one another and toward the opening (36), whereby to deform the lowermost folded sheet product to facilitate removal thereof through the opening (36). 20 25
7. A dispenser according to Claim 6, wherein said first contact surfaces (44, 46) are adapted to engage the end-most folded sheet product of the stack (S) closely adjacent to the first side edges (12, 14) of said sheet product whereby to bend said end-most folded sheet product about an axis (Y-Y) generally parallel to said first contact surfaces. 30 35
8. A dispenser according to Claim 6 or 7, further comprising a second pair of inclined second contact surfaces (60, 62), said second contact surfaces leading from a second pair of opposed housing side walls (24, 26) and gradually converging toward one another and toward the opening (36), said first and second contact surfaces forming a continuous, smoothly curved surface (44, 46, 60, 62) about the periphery of said opening (36) and at least partially defining said opening. 40 45
9. A dispenser according to Claim 7 or 8, wherein said second contact surfaces (60, 62) are adapted to engage the end-most folded sheet product of the stack closely adjacent the second side edges (64, 66) thereof whereby to bend said end-most folded sheet product about an axis (X-X) generally parallel to said second contact surfaces. 50 55

10. A dispenser according to any of the preceding claims comprising a blocking member (80) operatively associated with said housing (20) responsive to shortening of said stack (S) of folded sheet products during depletion thereof to a predetermined stack length, said blocking member (80) being retained in a retracted position by said stack and permitting free downward movement of said stack in said retracted position and biased toward a second position in which the lower end of said blocking member projects into said housing interior restricting upward movement of said products in said stack (S) when said stack length reaches a predetermined level.

11. A dispenser according to Claim 9, wherein the blocking member (80) comprises a flap (86) pivotally connected to said housing at a location and a counterweight (90) connected to said flap (86) operable under the influence of gravity to urge said flap toward said second position.

12. A dispenser according to Claim 10 or 11, wherein said blocking member (80) has a bottom surface (92) extending outwardly from said dispenser back wall (18) and into said housing interior above said stack of folded sheet products when said blocking member (80) is in said second position.







European Patent
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EUROPEAN SEARCH REPORT

Application Number

EP 92 30 1957

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	FR-A-2 538 695 (BEGHIN-SAY) * page 5, line 36 - page 7, line 37; figures * ---	1-4	A47K10/42
X	US-A-1 898 983 (WHEELER) * the whole document * ---	1-3	
A	US-A-3 203 586 (DOWNHAM) * the whole document * ---	6-9	
A	CH-A-524 350 (SCHNYDER) * column 2, line 14 - column 3, line 26; figures * ---	8-10	
A	US-A-2 172 140 (KIEFT) * the whole document * ---	5	
A	US-A-1 508 020 (HORNWITT) * page 1, line 33 - page 1, line 53; figure 2 * -----	5	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			A47K A47G B65H
Place of search THE HAGUE		Date of completion of the search 08 JULY 1992	Examiner VISTISEN L.
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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