Sept. 21, 1965 N. MARCALUS 3,207,361

METHOD OF PACKAGING AND PACKAGE OF INTERLEAVED SHEETS

Filed June 19, 1963 4 Sheets-Sheet 1

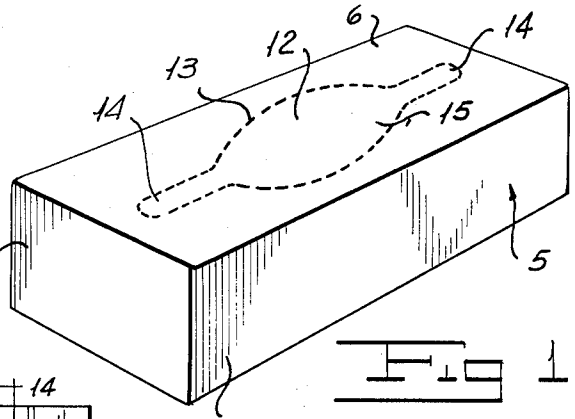


Fig 1

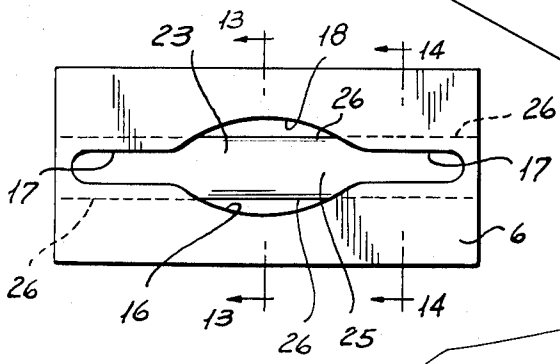


Fig 2

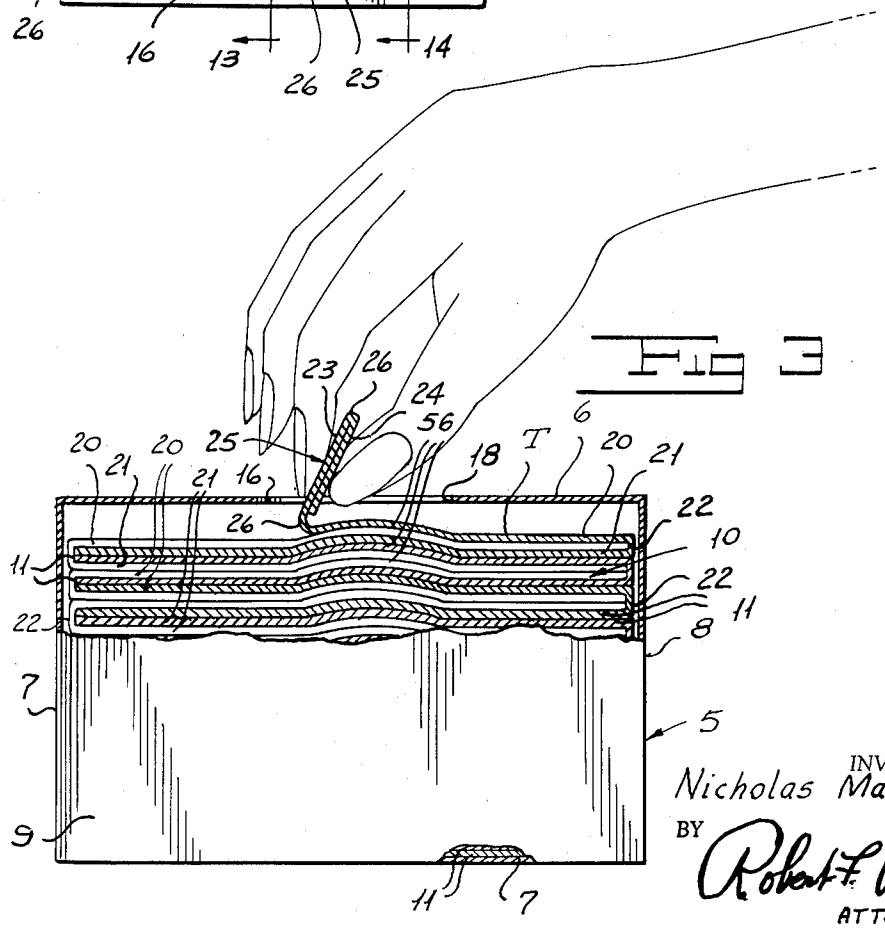


Fig 3

INVENTOR.
Nicholas Marcalus
BY
Robert F. Beck
ATTORNEY

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METHOD OF PACKAGING AND PACKAGE OF INTERLEAVED SHEETS

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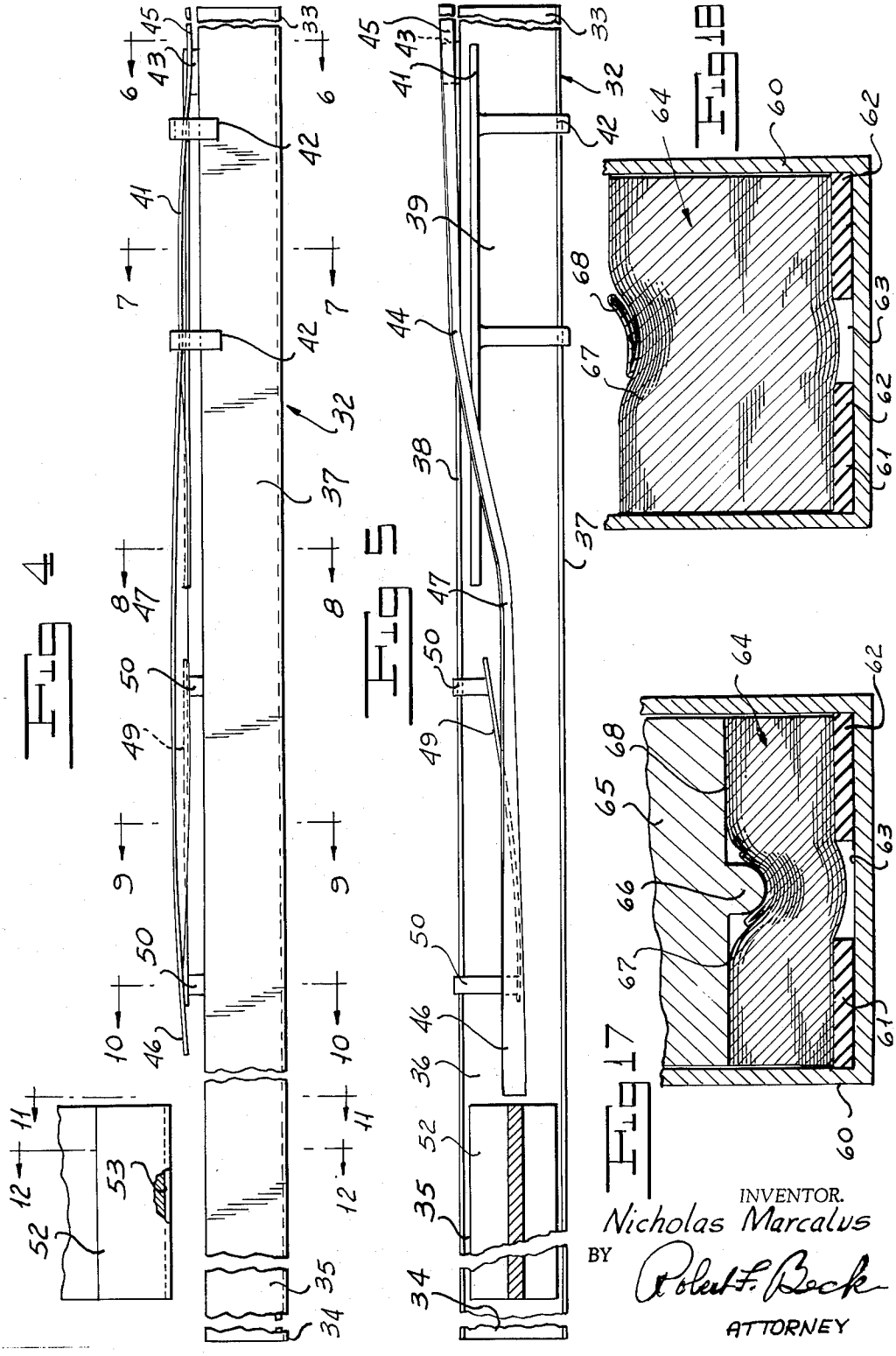


FIG 4

FIG 5

FIG 18

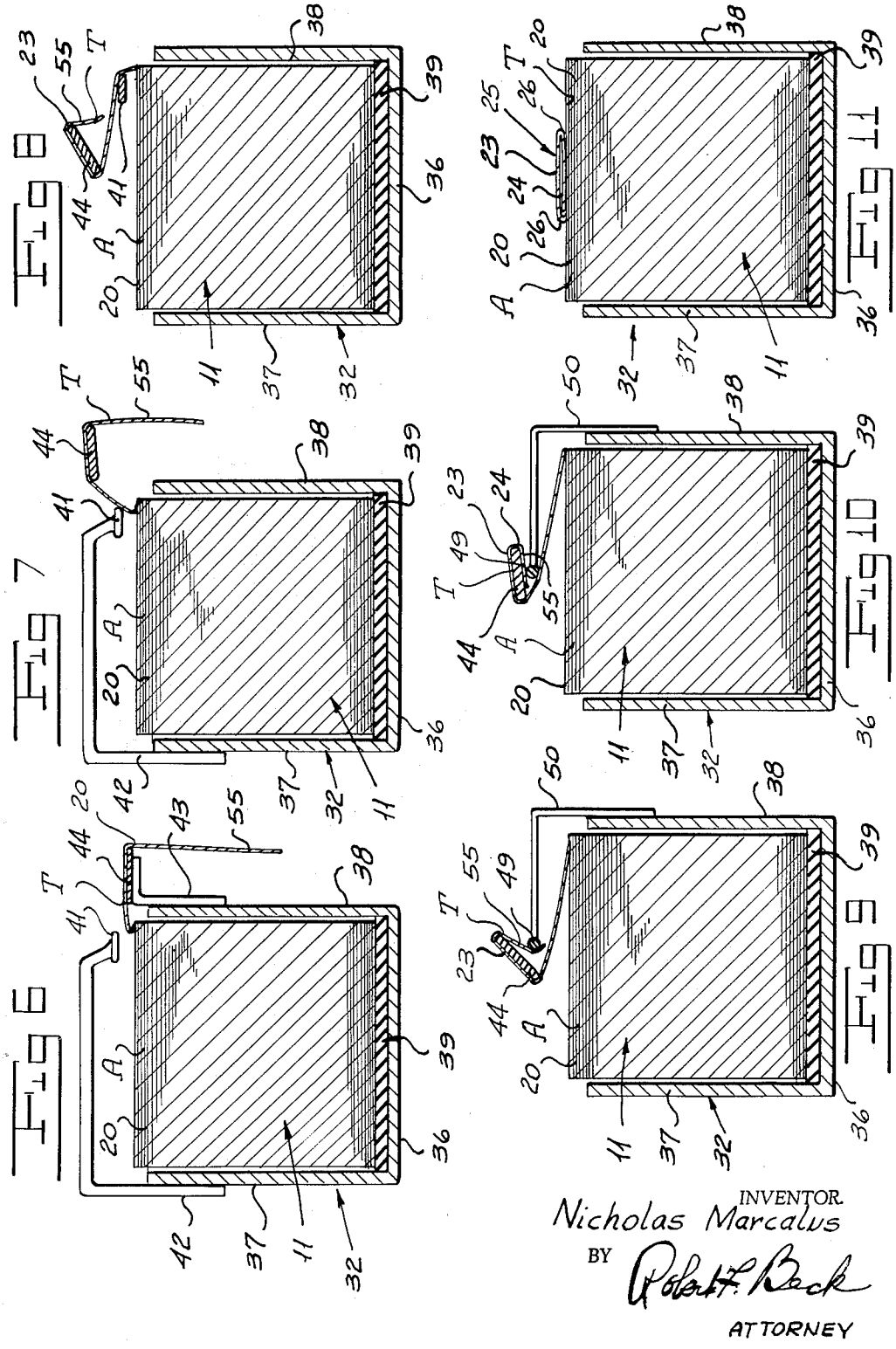
FIG 17

INVENTOR.
Nicholas Marcalus
BY
Robert F. Beck
ATTORNEY

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METHOD OF PACKAGING AND PACKAGE OF INTERLEAVED SHEETS

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INVENTOR.
Nicholas Marcalus
BY Robert L. Beck
ATTORNEY

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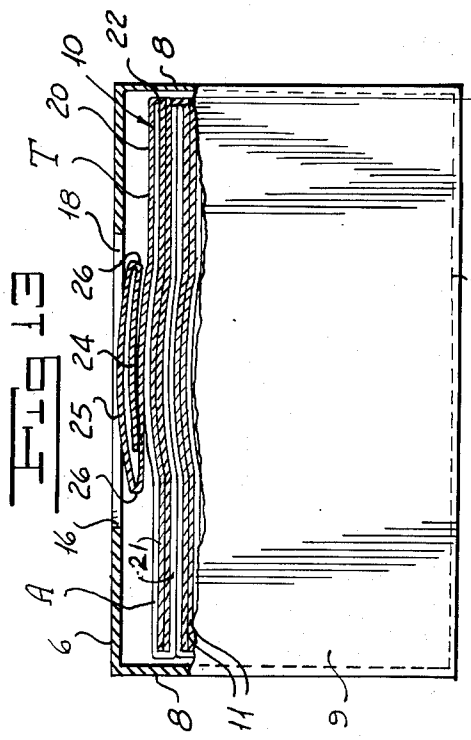


Fig 13

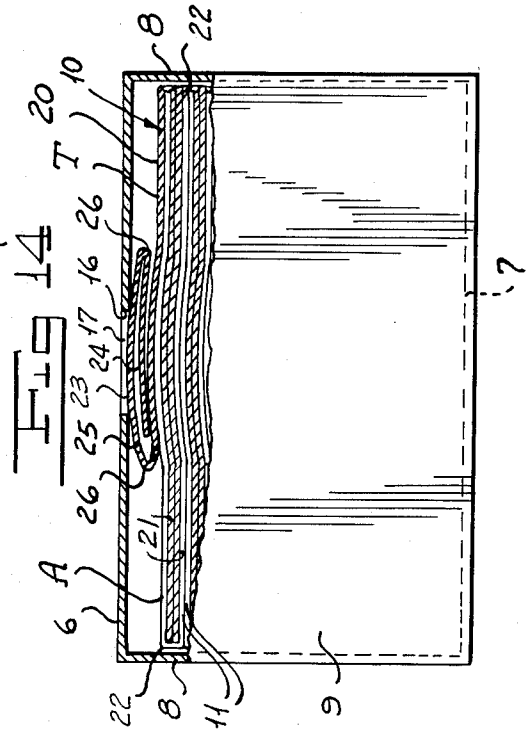


Fig 14

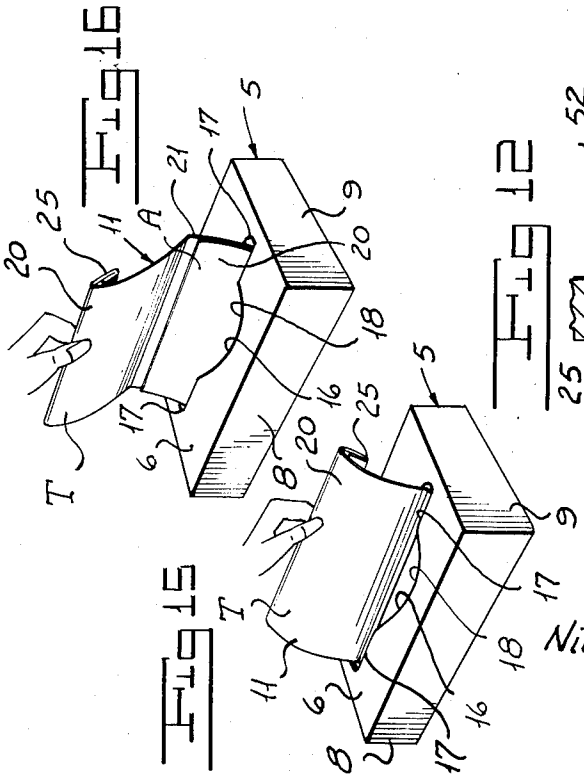


Fig 15

Fig 16

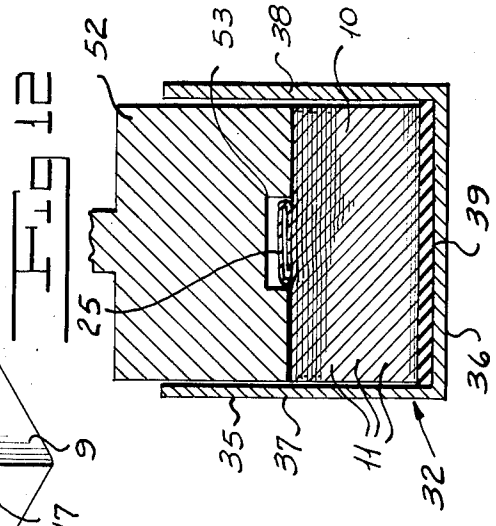


Fig 12

INVENTOR.
Nicholas Marcalus
BY
Robert F. Beck
ATTORNEY

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3,207,361

METHOD OF PACKAGING AND PACKAGE OF INTERLEAVED SHEETS

Nicholas Marcalus, West Englewood, N.J.
(1 Market St., East Paterson, N.J.)

Filed June 19, 1963, Ser. No. 289,001
7 Claims. (Cl. 221—48)

My invention relates to dispensing of paper products and more particularly to means and a method whereby the initial tissue of a pack of paper tissues may be dispensed or withdrawn from a container or the like with facility.

It is well known that packs of paper or facial tissues and the like are packaged in relatively shallow cardboard containers, boxes or receptacles, the latter being formed with dispensing openings or slots through which the tissues from the packs are withdrawn for use. In many instances, the tissues are interfolded in order that a section of one tissue of each pack will extend outwardly through the slot to facilitate subsequent withdrawal of an adjacent tissue. Heretofore, considerable difficulty has been experienced in withdrawaing the initial or outermost tissue from the pack because of the location of its free edge with respect to the location and relatively small size of the slot, thus necessitating a so-called "digging" by the fingers of the user with resultant rupturing or damaging of at least the outermost tissue.

My invention overcomes the foregoing difficulties and disadvantages, it being one of the objects thereof to provide a package of tissues wherein the container is fashioned with an opening of an adequate size and shape to permit insertion of the fingers of the user into the container, and a pack of tissues disposed in the container and having the outermost tissue, adjacent the opening, formed with finger gripping means accessible through the opening for easy grasping by the fingers to effect withdrawal of the outermost tissue from the pack.

Another object of my invention resides in a method of forming a pack of tissue products in a manner to provide an outermost product with a free margin disposed substantially lengthwise and centrally of the pack and in a different plane from that of the remaining portion of the outermost product.

A further object of my invention is to provide a pack of paper tissues having an outermost tissue fashioned with a centrally disposed and lengthwise extending free margin formed with a reinforcing tuck for grasping by the fingers of a user to effect withdrawal of the outermost tissue from a container.

A still further object of my invention is to provide means for folding the outer section of an outermost tissue of a pack in a manner to form a reinforced free margin disposed centrally of and overlying the pack together with means for causing the margin to be disposed outwardly of the top of the pack for easy grasping by the fingers of a user.

An important object of my invention is to provide a method of forming a pack of paper products for insertion within a container for ready withdrawal through an opening in the container by deforming portions of at least some of the products adjacent the opening in a manner to expose and render freely accessible through the opening a deformed portion of the outermost product for ready grasping and withdrawal through the opening without rupture thereto.

Another important object of my invention is to provide a pack of paper products of the foregoing described character which is simple in construction and efficient in use.

With the above and other objects in view, as will hereinafter appear, the invention consists in the combination

and arrangement of parts hereinafter set forth and illustrated in the accompanying drawings from which the several features of the invention and the advantages attained thereby will be readily understood by those skilled in the art.

Referring to the drawings wherein like reference characters designate like parts throughout the several views:

FIGURE 1 is a perspective view of a closed container in which a pack of tissues, fabricated in accordance with my invention, is encased for distribution and use;

FIGURE 2 is a top plan view of the container with the tear strip removed;

FIGURE 3 is a transverse sectional view with the tear strip removed and illustrating an initial step in withdrawing the topmost tissue from the container;

FIGURE 4 is a side elevation of the conveyor;

FIGURE 5 is a top plan view of the conveyor;

FIGURES 6, 7, 8, 9, 10, and 11 are detailed sectional views taken on the lines **6—6**, **7—7**, **8—8**, **9—9**, **10—10**, and **11—11** of FIGURE 4, respectively, with a pack of tissues disposed in the conveyor;

FIGURE 12 is a sectional view taken on the line **12—12** of FIGURE 4 and illustrating the die in compressing position;

FIGURES 13 and 14 are sectional views taken on the lines **13—13** and **14—14** of FIGURE 2, respectively;

FIGURES 15 and 16 are perspective views illustrating different phases in the withdrawal of tissues from the container;

FIGURE 17 is a transverse sectional view taken through the compressing station and illustrating a modified form of die and conveyor with the die being in lowered position; and

FIGURE 18 is a cross-sectional view of the pack shown in FIGURE 17 and after retraction of the die.

As illustrated in FIGURES 1 to 16 of the drawings, there is disclosed a flat blank of paperboard or similar material which is scored and folded in a manner to provide a relatively shallow box, receptacle or container **5** having top, bottom, side and end walls **6**, **7**, **8**, and **9**, respectively. One of the side walls **8** and each end wall **9** is of a laminated construction with the laminations of each wall being sealed together to completely close the container and encase therein paper products, for instance, a compressed stack or pack **10** of interfolded facial tissues **11**, a somewhat typical example of such a pack being disclosed in my U.S. Patent No. 2,730,267.

The top wall **6** is formed with an area constituting an elongated lengthwise extending removable tear strip or member **12** defined by perforations **13** to facilitate rupture of the top wall about the strip **12** to permit its removal from the top wall. The strip is disposed in spatiality with the end and side walls, as shown in FIGURE 1, and is of a somewhat prolate shape having relatively narrow end portions **14** extending outwardly from a somewhat large ovaliform intermediate portion **15**. The removal of the tear strip **12** serves to form the top wall **6** with an opening or slot **16** comprising relatively long and narrow branches **17** extending laterally outwardly from a large intermediate bay **18** as depicted in FIGURE 2. The slot or opening **16** corresponds in shape to the tear strip and through which opening **16** the tissues **11** are withdrawn from the contanier for use.

In FIGURE 3 of the drawings, the interfolded relation of the tissues **11** of each pack is detailed, it being understood that, in certain instances, by reason of the interfolding operation, the tissues may be connected together by relatively narrow spaced ties defined by incomplete lines of severance and which ties are such as are easily ruptured to facilitate separation of one tissue from another during withdrawal from the container. Each tissue **11** is in the form of a sheet which is centrally folded to

provide a pair of elongated upper leading and lower trailing sections 20 and 21, respectively, connected together by a longitudinal fold 22. The sections 20 and 21 have interfolded therebetween similar sections of adjacent tissues with their respective folds 22 being alternately disposed relative to the side walls 8 of the container 5 when the pack is disposed therein.

The leading section 20 of the topmost tissue T is formed, by a method hereinafter more fully described, with a longitudinally folded free margin 23 having a reinforcing truck 24. The margin 23 constitutes a finger grip 25 having longitudinal edges 26 and disposed centrally and lengthwise of the pack subjacent the top wall 6 when the tissues are initially packaged or encased in the container. While each of the tissues 11 may be of a single ply or sheet, it is to be distinctly understood that any number of plies or sheets may be employed to form a tissue, and that the thickness of the tissues and the walls of the receptacle or container, as shown, have been somewhat exaggerated or diagrammatically depicted in the interest of clarity. It is also to be understood that any suitable machine may be employed for interfolding the tissues, one example of such a machine being disclosed in my U.S. Patent No. 2,449,663.

As illustrated in FIGURES 4 and 5 of the drawings, an elongated conveyor 32 is provided at its front and rear ends with receiving and discharging stations 33 and 34, respectively, and a compressing station 35 located forwardly of and adjacent the discharge station 34. The conveyor is provided with a bottom wall 36, spaced sinistral and dextral side walls 37 and 38, respectively, (as viewed in FIGURE 6) and an endless conveyor belt 39 disposed between the side walls 37 and 38 for travel relative thereto and over the bottom wall 36. A relatively short hold-down member or guide rail 41 is secured to the side wall 37 by means of brackets 42 and is disposed slightly inwardly of and above the opposite wall 38.

Attached to the front end of the side wall 38, by means of an elongated bracket 43, is a cantilever-like member constituting a relatively narrow and somewhat sinuous elongated tissue folding bar or blade 44. The front end 45 of the blade 44 is disposed forwardly with relation to the hold-down member 41 and slightly laterally of and above the wall 38 in a substantially horizontal plane. The rear end 46 of the blade 44, which is also disposed in a substantially horizontal plane, is positioned above and centrally of the walls 37 and 38. Between its ends 45 and 46, the interjacency 47 of the blade is suitably curved to progressively dispose the blade inwardly, from the front to rear ends, in a direction toward the wall 37 and at varying angles relative to horizontality as shown in FIGURES 7 to 10 of the drawings.

Between the hold-down member 41 and the compressing station 35, there is provided a rod or tucker 49 having its ends secured to the wall 38 by brackets 50 and which tucker 49 is slightly curved lengthwise and extends under the folding blade 44 for cooperation therewith. The front end of the tucker 49 is disposed in close proximity to the wall 38 and spaced rearwardly from the hold-down member 41 while its rear end terminates forwardly of and beneath the end 46 of the folding blade 44 as shown in FIGURE 4.

The compressing station 35, which includes the walls and belt of the conveyor, has associated therewith a vertically movable die or plate 52 having its under face formed with a centrally and longitudinally extending slot or recess 53. The width of the slot 53 is somewhat greater than the finger grip 25, while the width of the die 52 is substantially that of the distance between the walls 37 and 38 to permit vertical movement therebetween as clearly illustrated in FIGURE 12 of the drawings.

When a pack 10, removed from the interfolding machine, is deposited on the conveyor at the receiving station, the upper leading section 20 of the topmost tissue T is moved transversely toward its respective lengthwise

fold 22 and draped over the folding blade 44 to provide a depending component 55 as illustrated in FIGURE 6. As the pack travels rearwardly on the conveyor belt 39 it passes under the hold-down member 41 with the result that the component 55 is elevated by the holding blade 44 and moved into engagement with the hold-down member 41 as shown in FIGURE 7.

Continued travel of the pack serves to loop the component 55 about the blade 44 to define the margin 23 by reason of the angularity and position of that portion of the interjacency 47 of the blade relative to the member 41 as depicted in FIGURE 8. As the pack continues to move, the margin 23 is engaged by the tucking rod 49 which cooperates with the folding bar 44 to move the margin inwardly towards the underface of the blade 44 as clearly shown in FIGURE 9.

As the pack approaches the compressing station 35 and the rear end of the folding blade 44, the margin 23 is tucked about and under the folding blade to form the tuck 24 by the action of the tucker 49 as shown in FIGURE 10. As the pack advances into the compressing station, the margin 23 is progressively released from the folding blade to permit descent thereof onto the upper leading section 20 of the adjacent tissue A with the margin 23 and its tuck 24 extending longitudinally and centrally of the pack to constitute the finger grip 25 as illustrated in FIGURE 11.

When the pack is thus moved into the compressing station 35, the die 52 is moved downwardly to compress the tissues of the pack into a compact condition and, by reason of the slot 53, deform at least the uppermost tissues in a manner to dispose the margin 23 in a position out of the plane of the portions of the adjacent trailing section 21 which extends beneath the die laterally of the slot. This deformation of the aforesaid tissues serves to provide them with protuberances 56, as illustrated in FIGURE 3.

Upon raising of the die 52, the pack travels to the discharge station 34 of the conveyor from where it is removed, sized, if necessary, and inserted into the container 5 through an open end thereof, the latter being thereafter closed and sealed whereby the tissues are encased in the container for distribution and use. It is to be understood that each pack may be of a greater size as to length than the container in which it is to be encased and thereafter be transversely severed into suitable lengths for insertion into containers of like lengths, respectively, while at the discharge station or after removal therefrom. In use, the belt 39 is intermittently operated to position an entire pack within the compressing station for compressing by the die, the latter being operated in synchronism with the belt to effect compressing of the pack with a single downstroke of the die.

In order to preclude appreciable drag or resistance to thereof or engagement with the top wall of the container the movement of the uppermost tissues by any buckling thereof or engagement with the top wall of the container during withdrawal, the pack is compressed to a preestablished degree to permit it to extend to a predetermined height and thus inserted into a container of a slightly greater height to provide sufficient space between the top of the pack and the top wall. In some instances, by way of example, the pack may be compressed by the die to a height of approximately 1⅞" and thereafter permitted to expand to a height of approximately 2½" for insertion into a container having an inside height of 2¾" thereby providing approximately ¼" of space between the top wall and the pack and with the assumption that the container is disposed on a substantially horizontal support.

When a pack of tissues has been encased in a container for distribution and use and the tear strip 12 removed from the top wall, the intermediate portion of the finger grip 25, including the longitudinal edges 26 thereof, will be exposed through the bay 18 as shown in FIG-

URES 2 and 13, while the longitudinal edges **26** of the end portions of the finger grip will be concealed beneath the top wall between the side walls **8** and the branches **17** of the opening **16** as illustrated in FIGURES 2 and 14. By exposing the finger grip **25** through the relatively large bay **18**, the fingers of the user may be readily inserted through the bay to easily grasp the finger grip, as depicted in FIGURE 3, for withdrawal outwardly through the opening without difficulty thereby precluding any rupture and/or bunching of the tissues by "digging" with the fingers or otherwise attempting to locate and grasp the free end of the upper section of the topmost tissue as practiced before my invention.

Outward movement of the finger grip serves to effect withdrawal of the leading section **20** of the topmost tissue T through the slot **16** as shown in FIGURE 15. As the section **20** of the tissue T is thus withdrawn through the slot, the upper leading section **20** of the adjacent tissue A will be automatically lead or pulled through the slot with the trailing section **21** of the tissue T, as depicted in FIGURE 16 of the drawings, as is usual in interfolded tissues. Upon withdrawal and release of section **21** of the topmost tissue T from the pack, the leading section **20** of the adjacent tissue A will extend through the slot and be disposed out of the container to permit easy grasping thereof by the fingers of the user to effect withdrawal of the tissue A from the pack. As the aforementioned tissues are thus withdrawn from the pack, the leading section of each topmost tissue of those remaining in the pack will extend through the slot **16** and above the container in successive order by reason of the interfolded relation of the tissues and until all the tissues are withdrawn from the container.

As disclosed, the slot **16**, for the greater part of its length, comprises the branches **17** with the edges of the top wall defining the branches serving to engage the tissues, as they are withdrawn through the slot, in a manner to impart a slight drag thereto and effect rupture of any ties connecting the trailing section of the topmost tissue with the leading section of the adjacent tissue thus insuring removal of the tissues one by one from the container. This construction permits the tissues to be easily withdrawn from the container, without any appreciable drag or resistance, in an open condition for immediate use by one hand of the user and without the aid of the other hand for holding the container to prevent upward lifting and/or falling of the package to the floor, into wash basins, toilet bowls, etc. Furthermore, the narrowness of the branches **17** sesrves to maintain at a minimum the weakening effect on the container as a whole and which effect is, as a necessity, occasioned by the removal of the tear strip.

As illustrated in FIGURES 17 and 18 of the drawings, a modified form of conveyor **60** is disclosed wherein the belt **61** thereof is provided with a pair of coextending runs **62** spaced from each other to define therebetween a central lengthwise gutter **63** over which the tissues **64** are positioned. The compression station is equipped with a vertical movable die **65** having an underface provided with a centrally longitudinally extending semicylindrical rib **66**. When the die is operated downwardly, it compresses the pack and forms the upper face thereof with a longitudinally extending channel or groove **67** in which is disposed the finger grip **68** and the bottom of the pack with a slight convexity extending into the gutter **63** between the runs of the belt to permit adequate deformation of the pack by the rib **66**.

When the die **65** is raised from the pack, the latter will expand to a pre-established height and maintain the groove **67** in the top thereof while the end of the finger grip **68** assumes a curled position above the remainder of the pack and is disposed in a manner for ready grasping and withdrawal as clearly illustrated in FIGURE 18. When a pack of this character is inserted into a container, the finger grip will underlie the tear strip and be readily accessible to the fingers of the operator through the bay of the container when the tear strip is removed, it being understood that the tissues of the pack are interfolded in the manner shown in FIGURE 3 and are withdrawn from the container in the sequential order as heretofore described.

As to the language used herein and in the claims, it is intended to cover all the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, may be said to fall therebetween. Furthermore, the terms "topmost," "outermost," "top," "bottom," "side" and "end" are used in a relative sense for the purpose of description and not by way of limitation, it being understood in some instances, that the various components of the invention may be arranged in a manner whereby the foregoing terms would not appropriately describe their relative positions. In view of the disclosure hereof, it is apparent that my invention provides a method and means whereby the initial or outermost tissue of a pack may be easily grasped through the withdrawal opening and withdrawn from the container.

Without further elaboration, the foregoing will so fully explain the invention that others may, by applying current knowledge, readily adapt the same for use under various conditions of service. Moreover, it is not indispensible that all the features of the invention be used conjointly since they may be employed advantageously in various combinations and subcombinations.

It is obvious that the invention is not confined solely to the use herein disclosed in connection therewith as it may be utilized for any purpose to which it is adaptable. It is therefore to be understood that the invention is not limited to the specific construction as illustrated and described, as the same is only illustrative of the principles involved, which are capable of extended application in various forms, and the invention comprehends all construction within the scope of the appended claims.

What I claim is:

1. A package of paper products comprising, a closed container having a flat bottom wall and a top wall provided with a tear strip, said tear strip being of a shape having narrow end portions and a relatively large intermediate portion and defining a product dispensing opening of a coinciding shape upon removal of said tear strip, a pack formed by a plurality of superimposed interleaved paper products encased in said container and having a product disposed beneath said top wall, the outer face of said product being free for movement towards said top wall, said product being formed with a free end margin provided with a reinforcing tuck and extending centrally over said pack beneath said strip, a substantial number of the top products of said plurality of said paper products forming said pack having a raised portion throughout the region of said margin to form a ridge to project said margin outwardly of the pack to render said margin accessible through said intermediate portion upon removal of said strip to facilitate withdrawal of said product through said opening.

2. A method of forming and packaging a plurality of paper products in a carton adapted to be provided with a dispensing opening, said method comprising: superimposing and interfolding a plurality of said products to form a pack, folding and refolding the outer margin of the outermost product to form a pair of spaced folds defining a double thickness finger grip between the folds, centering the said finger grip centrally over the pack, compressing side portions of the pack on either side of the said finger grip while the said finger grip remains relatively uncompressed to form a raised portion on said pack at said finger grip, relieving the compressive forces on said side portions and permitting expansion of said side portions, and subsequently inserting said pack in a carton of the type wherein a dispensing opening may be

provided so that said finger grip is positioned adjacent said dispensing opening.

3. A method of forming and packaging a pack of paper products formed of a plurality of paper products in a container which is adapted to be provided with an elongated dispensing opening, said method comprising: superimposing and interfolding a plurality of said products to form a pack, folding the margin of the outer section of the outermost product of the pack of said products to form a pair of spaced folds defining a finger grip between the folds, positioning said finger grip centrally over the pack, compressing end portions of the pack on either side of said finger grip to form a relatively raised portion on said pack at said finger grip to dispose the latter out of the plane of the outermost product to render said grip freely accessible through the dispensing opening, and subsequently inserting said pack in a container of the type wherein an elongated dispensing opening may be provided so that said finger grip is positioned beneath said dispensing opening.

4. A method of forming and packaging a plurality of paper products in a container which is adapted to be provided with a dispensing opening, said method comprising: stacking the products to form a pack, positioning the outermost margin of the outermost product to provide a finger grip, compressing end portions of the pack on either side of said margin to form a raised portion on said pack at said margin, and subsequently enclosing said pack in a container of the type wherein a dispensing opening may be provided so that said margin is positioned adjacent said dispensing opening.

5. A package of paper products comprising, a container having a flat bottom wall and a top wall having an elongated, product dispensing opening therein, a pack formed by a plurality of superimposed, interleaved paper products encased in said container, the uppermost product of said pack disposed, in spaced relation, beneath said top wall and being free for movement towards said top wall, said uppermost product being folded to position a free end margin thereof centrally over said pack beneath said opening, a substantial number of the top products of said plurality of said paper products forming said pack being deformed throughout the region of said margin to form a ridge to project said margin upwardly of the pack to render said margin accessible through said opening to facilitate withdrawal of said product through said opening.

6. A package of paper products comprising, a container having a bottom wall and a fixed top wall provided with an elongated product dispensing opening therein, a pack formed by a plurality of superimposed, interleaved paper products encased in said container, the uppermost product of said pack disposed, in spaced relation, beneath said

top wall and being free for movement towards said top wall, said uppermost product being folded to position a free end margin thereof centrally over said pack beneath said opening, a substantial number of the top products of said plurality of said paper products forming said pack being deformed throughout the region of said margin to form a channel above which said free end margin is curled to project the latter upwardly of the pack to render said margin accessible through said opening to facilitate withdrawal of said product through said opening.

7. A package of paper products comprising, a container having a bottom wall and a fixed top wall provided with a tear strip, said tear strip being of a shape having narrow end portions and a relatively large intermediate portion and defining a product dispensing opening of a coinciding shape upon removal of said tear strip, a pack formed by a plurality of superimposed, interleaved paper products encased in said container and having a product disposed beneath said top wall, said product being formed with a free end margin provided with a reinforcing tuck and extending centrally over said pack beneath said strip, a substantial number of the top products of said plurality of said paper products forming said pack being deformed throughout the region of said margin to form a channel above which said free end margin is curled to project the latter outwardly of the pack to render said margin accessible through said intermediate portion upon removal of said strip to facilitate withdrawal of said product through said opening.

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LOUIS J. DEMBO, *Primary Examiner.*

KENNETH N. LEIMER, RAPHAEL M. LUPO, *Examiners.*