Oct. 25, 1966 F. C. STEINBOCK 3,280,987

TAPE SPINDLE

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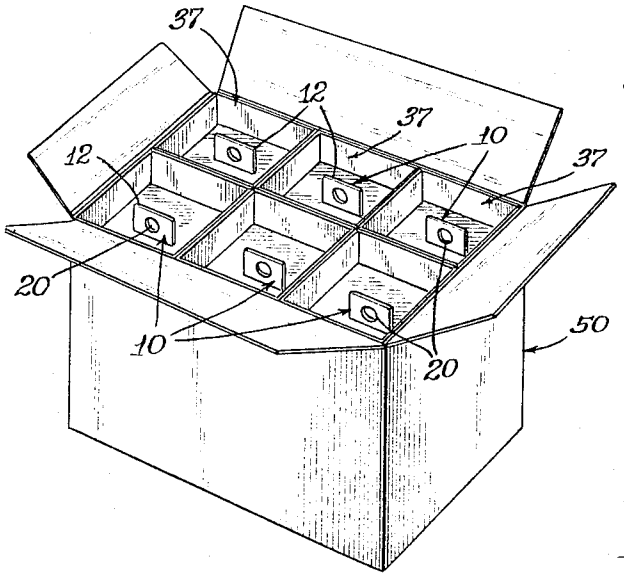


Fig. 1.

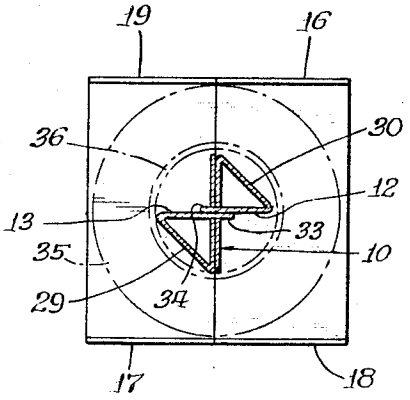


Fig. 3.

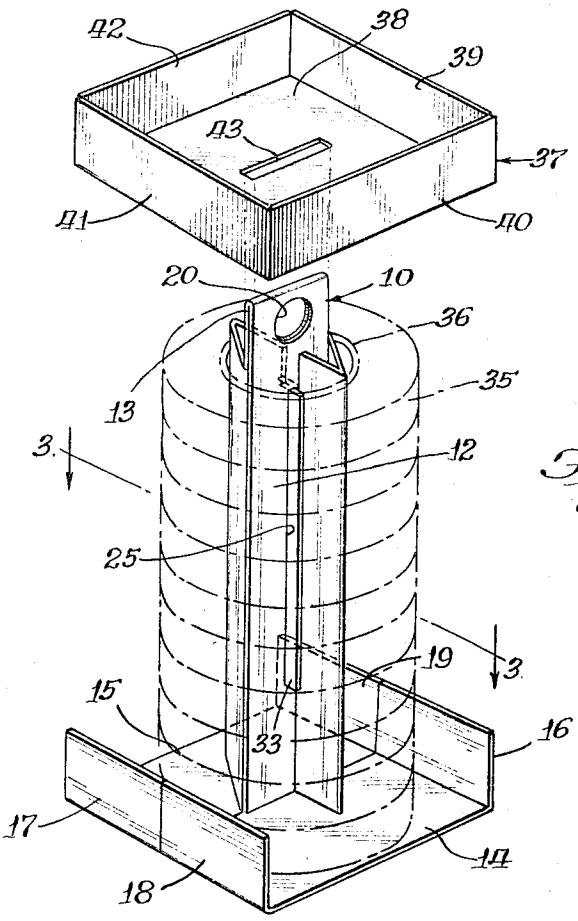


Fig. 2.

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Fig. 4.

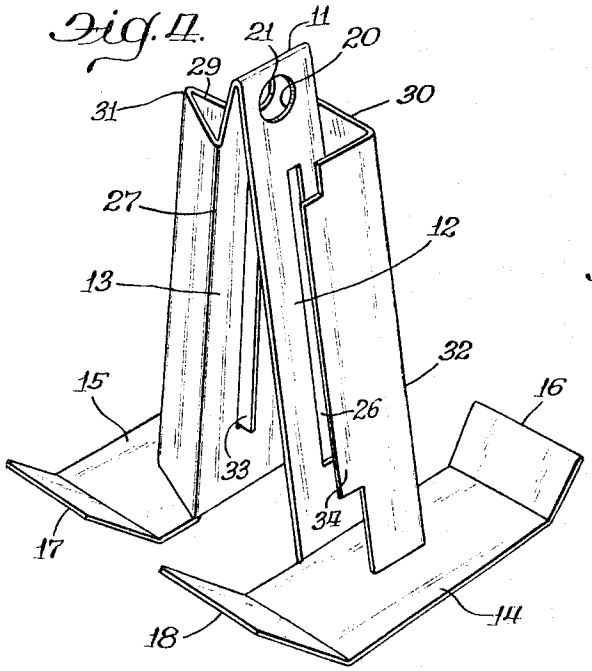


Fig. 5.

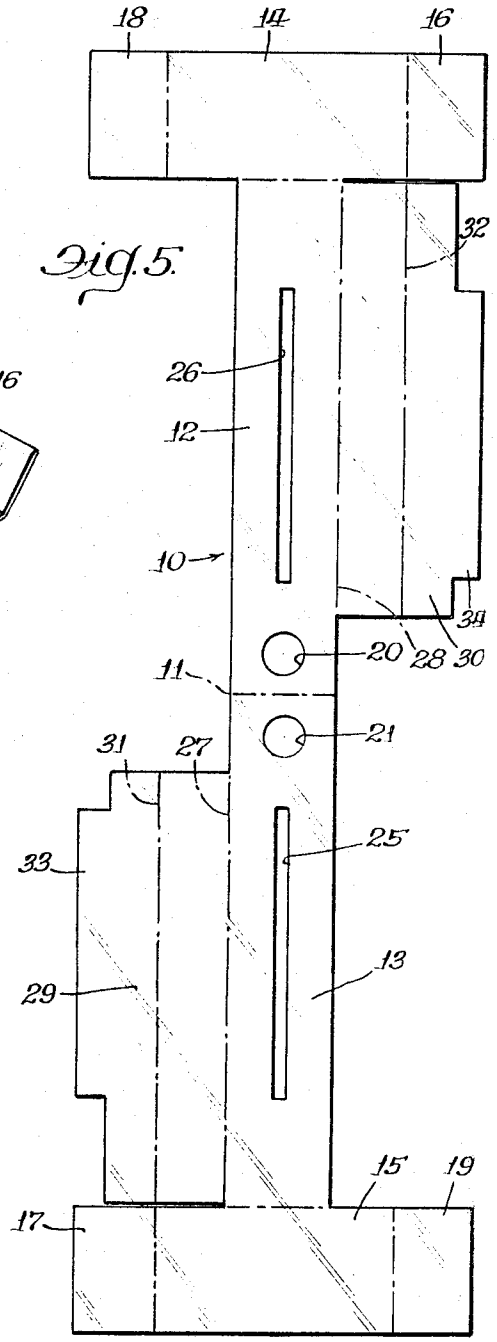
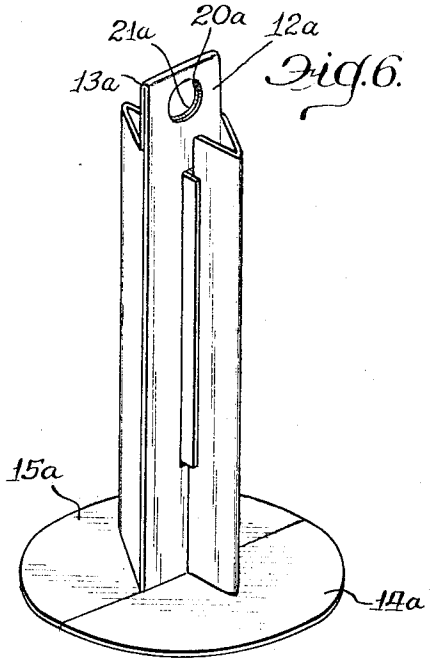


Fig. 6.



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TAPE SPINDLE

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18 Claims. (Cl. 211—59)

This invention relates to a spindle for rolls and spools of tapes and the like and to a blank for forming such a spindle.

It is a prime object of this invention to provide an inexpensive spindle of light material which is sufficiently rigid to serve not only as a carrier unit for tapes and the like, but also as a dispensing unit and, in its preferred form, as a protective packaging therefor.

Principal features of this invention are that the spindle and blank from which the spindle is assembled comprise a pair of hingedly connected post portions of equal length having hingedly connected at their ends base members transversely extending beyond each side of the post portions a predetermined distance. Panel members are hingedly connected to opposite sides of the post portions and have tab members on the outer edges thereof. A single fold line only, parallel to the hinge line thereof, divides the panel member. Slots are provided in the post portions to receive the tab members. In an assembled condition the spindle is characterized in that the panel members folded in opposite directions with tabs extending through the slots, in section, comprise triangles to provide rigidity and strength. In the preferred embodiments of this invention, the triangles are like sized isosceles triangles with oppositely facing parallel bases, the tab members extending through the same slots to form with the center posts a symmetrical right angle cross of equal height and width.

Other objects, advantages and features of this invention will be apparent to those skilled in the art from the following detailed description thereof together with the accompanying drawings wherein:

FIG. 1 is an isometric view of the invention as used in a packing container;

FIG. 2 is an enlarged isometric view of a preferred embodiment of the invention;

FIG. 3 is a sectional view taken along the line 3—3 of FIG. 2;

FIG. 4 is a reduced isometric view of the embodiment of the invention shown in FIGS. 2 and 3 partially assembled;

FIG. 5 is an enlarged elevation of the preferred embodiment of the invention shown in FIG. 4 prior to assembly; and

FIG. 6 is a reduced isometric view of an alternate preferred embodiment of the invention.

With reference to the drawings, and particularly FIG. 5 thereof, a blank is provided preferably of corrugated cardboard. The blank is cut to have a post, generally designated **10**, comprising a pair of post portions **12, 13** of equal length hingedly connected at transverse fold line **11**. At the outer ends of the post portions **12, 13** are base members **14, 15** hingedly connected thereto by transverse fold lines parallel to the fold line **11**.

The widths of the post portions **12, 13** are approximately equal to, or just slightly smaller than, the inner diameter of tape holding spools **36**, shown in FIGS. 2 and 3, to be placed thereon. The lengths of the post portions **12, 13** are greater than the total height of the spools **36**. The base members **14, 15** extend transversely along the edges connected to the post portions **12, 13** beyond

each side of the post portions **12, 13**, preferably to a length equal to or slightly larger than the greater of the outer diameter of the spool **36** or tape **35**. In their other dimensions the base members **14, 15** preferably extend one half the transverse length thereof.

In the alternate preferred embodiment of this invention, illustrated in FIG. 6, the base members **14*a*, 15*a*** are each semi-circular in shape. In the preferred embodiment of FIGS. 2–5, however, the base members **14, 15** are rectangular and are each provided at its opposite edges, on parallel fold lines, with hingedly connected wall panels **16, 18, 17, 19**.

Hingedly connected along fold lines **27, 28** to opposite sides of the post portions **12, 13** are a pair of like sized panel members **29, 30** extending from adjacent said base members **14, 15** lengthwise a distance at least equal to the total height of the spools **36** to be mounted thereon, but preferably less than the length of the post portions **12, 13**.

For minimizing wastage in cutting blanks, the total distance between the edges of the base members **14, 15**, remote from the post portions **12, 13**, to the inner edges of respectively adjacent panel members **30, 29** is no greater than the distance from such inner edges to the facing edges of respectively remote base members **15, 14**. Using this arrangement, a series of blanks may be cut from a sheet of material with the panel members and wall members of one blank abutting the post portions of an adjacent blank and wastage may thereby virtually be eliminated.

The panel members **29, 30** are divided by fold lines **31, 32** extending in parallel relation to fold lines **27, 28**. Tab members **33, 34** of like dimension are provided on the outer edges of panel members **29, 30** and have a reduced lengthwise dimension relative to that of the panel members **29, 30**.

In the preferred embodiment of the invention, the outer portions of the panel members **29, 30** have a width, between fold lines **32, 31** and tab members **33, 34**, equal to one half that of post portions **12, 13**. Also in the preferred embodiment, the inner portions of the panel members **29, 30**, between respective fold lines **27, 31** and **28, 32**, have a width equal to the square root of twice the width of the outer portions squared, i.e.

$$Wi=\sqrt{2Wo^2}$$

A pair of matching slots **25, 26** are provided one in each of the post portions **12, 13**. The term "matching slots" is intended to be understood to mean that the slots are of like dimension, of length equal to that of tab members **33, 34**, extending in lengthwise alignment parallel to fold lines **27, 28**, and positioned in transverse alignment with tab members **33, 34**. In the preferred embodiment of the invention, the slots **25, 26** are positioned equidistantly from the sides of the post portions **12, 13**.

Finally, adjacent fold line **11**, between the inner edges of panel members **29, 30**, are provided a pair of matching openings **20, 21**. Openings **20, 21** match in the sense that they are of like dimension and are aligned on the post portions **12, 13**.

The blank thus cut is formed into a spindle as is most clearly illustrated in FIGS. 2 and 4. The post portions **12, 13** are folded along line **11** to a face abutting position with base members **14, 15** at the bottom thereof. The base members **14, 15** are then folded outwardly away from each other to a common horizontal plane with their inner edges abutting. Wall panels **16, 18, 17, 19** are folded upwardly. The panel members **29, 30** are first folded along lines **27, 28** away from the vertical plane

extending between the face abutting post portions **12, 13**. The outer portions of the panel members **29, 30** are then folded inwardly toward the post portions **12, 13** and each tab member **33, 34** is positioned through both slots **25, 26** for locking therewith and with each other.

A spindle thus constructed, in section as shown in FIG. 3 results in a center post **10** having a double isosceles triangular configuration wherein the bases of the triangles are parallel and oppositely faced and wherein the apexes form right angles adjacent the slots. In effect a symmetrical, right angle cross of equal length and width is formed which combined with the triangular configuration results in great strength and rigidity of the spindle structure. The wall members **16, 18, 17, 19** provide a protective barrier from adjacent stacks of tapes in packing containers. The openings **20, 21** form a convenient handle for lifting the spindle particularly when loaded as in FIG. 2 and when in a packing container as in FIG. 1.

The utility of the spindle for protectively packing spools and the like is greatly enhanced when combined with the cover member, generally designated **37** illustrated in FIGS. 1 and 2. The cover member **37** comprises a generally square cover portion **38** having slot **43** therein sized to just receive endwise the handle of post portions **12, 13**.

Hingedly connected to each edge of the cover portion **38** is a preferably upstanding wall member **39, 40, 41, 42**. When mounted on the handle of the spindle and packed in a container with like spindles and cover members, such a cover member protects the spools mounted on its spindle from the adjacent spindles.

It will thus be seen that this invention provides a highly desirable protective packaging for spools, tapes and the like as well as a convenient carrier and strong dispensing unit therefor. As other embodiments within the spirit and scope of this invention will occur to those skilled in the art, the foregoing description of preferred embodiments is in no way intended to limit the scope of the following claims.

What is claimed is:

1. A blank, for forming a spindle to hold rolls and spools of tapes and the like, comprising:

a pair of post portions of equal length hingedly connected on a transverse fold line;

a pair of base members, transversely extending beyond the sides of said post portions, and being hingedly connected, one to each of the ends of said post portions, along fold lines parallel to said transverse fold line;

a pair of panel members, hingedly connected on fold lines, each to one of said post portions on opposite sides thereof extending from adjacent said base members and being divided by only one fold line parallel to said sides;

tab members on each of the edges of said panel members parallel to said sides; and

matching slots in said post portions for receiving said tab members therethrough to form a center post for said spindle.

2. The blank claimed in claim **1** wherein the distance between the inner edge of each of said panel members and the edge, most remote from said center posts, of its adjacent base member is no greater than the distance between said inner edge and the facing edge of its most remote base member.

3. The blank claimed in claim **2** wherein one of said panel members is connected to each of said post portions.

4. The blank claimed in claim **1** wherein said panel member dividing fold lines are spaced a predetermined distance from said sides whereby the portion of said panel members remote from said sides will form right angles with said post portions with said tab members inserted through said matching slots.

5. The blank claimed in claim **4** wherein said matching slots are spaced equidistantly from said sides.

6. The blank claimed in claim **5** wherein the distance from said panel member dividing fold lines to said tab members (Wo) is one half the distance between said sides and wherein the distance between said sides and their respective panel member dividing fold lines (Wi) is the square root of twice the former distance squared

$$(Wi=\sqrt{2Wo^2})$$

7. The blank claimed in claim **6** in which the distance between said sides is approximately equal to but just smaller than the predetermined inner diameter of spools and the like to be placed thereon.

8. The blank claimed in claim **7** wherein each of said base members is provided at its opposite edges on parallel fold lines with hingedly connected wall panels.

9. The blank claimed in claim **8** wherein one of said panel members is connected to each of said post portions, and wherein the distance between the inner edge of said panel members and the edges, most remote from said center posts, of their respective adjacent base members is no greater than the distance between said inner edges and the facing edges of their respective most remote base members.

10. A spindle, to hold rolls and spools of tape and the like, comprising:

a pair of vertically extending, face abutting, post portions of equal length hingedly connected along a transverse fold line at one end thereof;

a pair of base members, in edge abutting relation in a common horizontal plane, transversely extending at their abutting edges beyond the sides of said post portions and being hingedly connected at said abutting edges, one to each of the other ends of said post portions, along fold lines parallel to said transverse fold line;

matching slots in said post portions;

a pair of panel members hingedly connected on fold lines, each to one of said post portions on opposite sides thereof, extending from adjacent said base members, said panel members being folded at said hingedly connecting fold lines thereof, on opposite sides of the vertical plane of said face abutting post portions, to acute angles therewith and being folded on dividing fold lines, parallel to and remote from said sides, inwardly to abutting positions with said post portions adjacent said slots, together with said post portions, said panel members, in section, comprising triangles thereby forming a center post for said spindle; and

tab members, on each of the edges of said panel members parallel to said sides, inserted through said matching slots.

11. The spindle claimed in claim **10** wherein said dividing fold lines are spaced a predetermined distance from said sides whereby the portion of said panel members abutting said post portions forms a right angle therewith.

12. The spindle claimed in claim **11** wherein said matching slots are spaced equidistantly from said sides.

13. The spindle claimed in claim **12** wherein the distance from said panel member dividing fold lines to said tab members (Wo) is one half the distance between said sides and wherein the distance between said sides and their respective panel member dividing fold lines (Wi) is the square root of twice the former distance squared $(Wi=\sqrt{2Wo^2})$.

14. The spindle claimed in claim **13** in which the distance between said sides is approximately equal to but just smaller than the predetermined inner diameter of spools and the like to be placed thereon.

15. The spindle claimed in claim **14** wherein each of said base members is provided at its opposite edges on parallel fold lines with hingedly connected wall panels extending vertically therefrom in like direction with said center post.

16. The spindle claimed in claim 15 wherein one of said panel members is connected to each of said post portions.

17. The spindle claimed in claim 16 wherein said panel members are spaced from said transverse fold line.

18. The spindle claimed in claim 17 in combination with a cover member comprising: a cover portion extending in a horizontal plane, vertical wall members extending from the edges of said cover portion, and a slot in said cover portion receiving therethrough said post portion ends adjacent said transverse fold line.

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