Jan. 27, 1959 R. S. SHELLY 2,871,080

MULTIPLEX TUBE CONSTRUCTION

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FIG. 1.

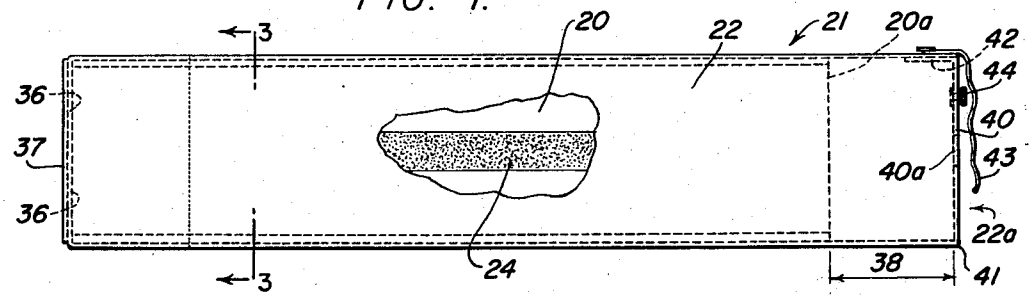


FIG. 2.

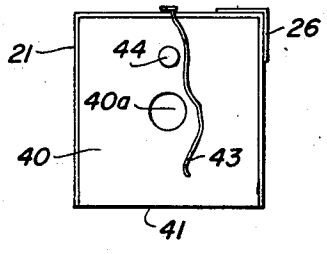


FIG. 3.

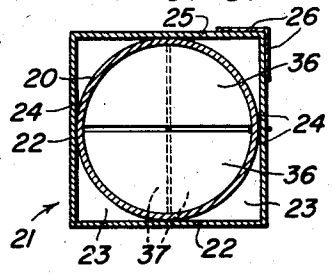


FIG. 4.

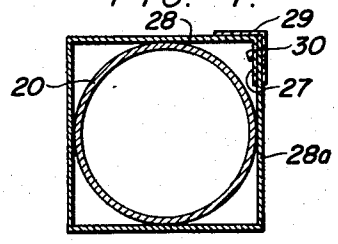


FIG. 5.

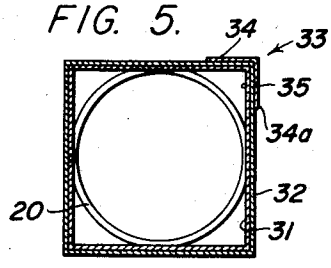
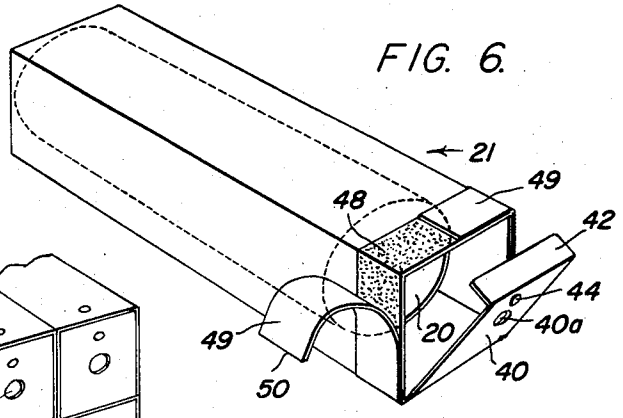


FIG. 6.



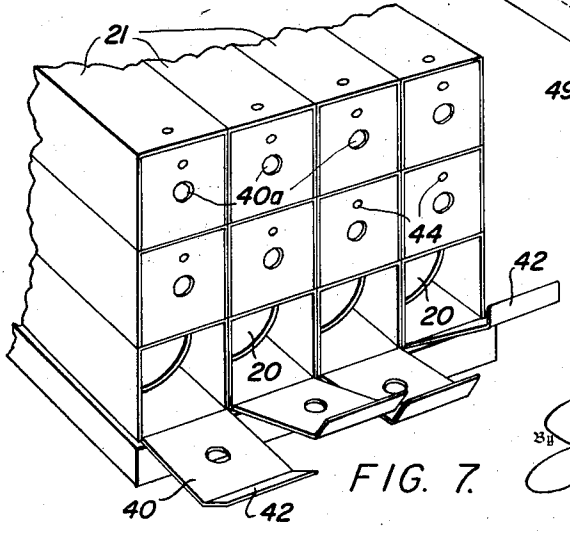


FIG. 7.

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FIG. 8.

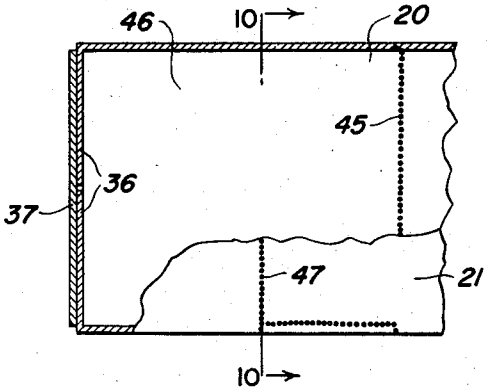


FIG. 8A.

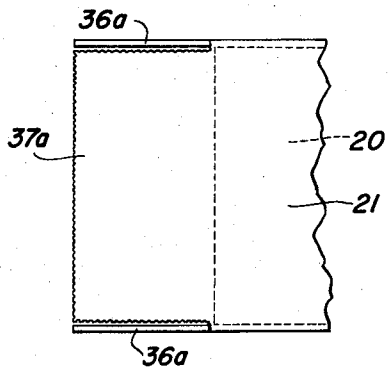


FIG. 11.

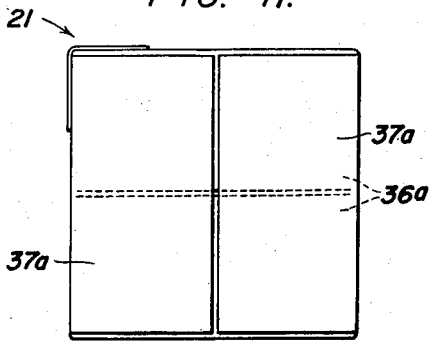


FIG. 10.

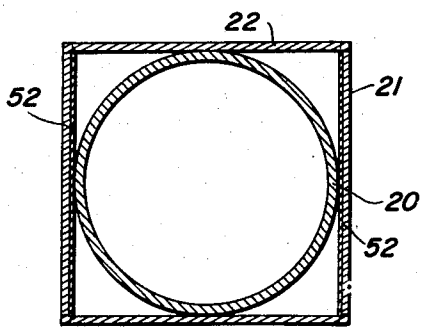
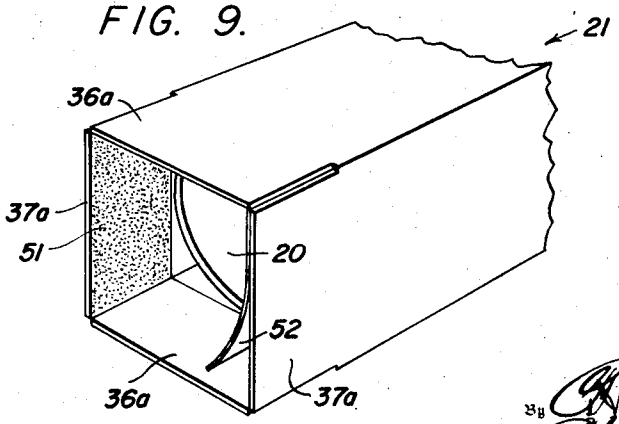


FIG. 9.



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United States Patent Office

2,871,080

Patented Jan. 27, 1959

2,871,080

MULTIPLEX TUBE CONSTRUCTION

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Application February 3, 1955, Serial No. 485,940

9 Claims. (Cl. 312—107)

This invention relates to multiplex tube construction, which is particularly adapted for the storage of rolled records, such as engineering drawings. The device is particularly useful in filing and storing large drawings, although it is not necessarily so restricted.

Engineering drawings comprising sheets within reasonable sizes are easily kept in cabinet drawers, but when such reasonable sizes are exceeded, the most convenient way to take care of the drawings has been found to be in the rolled form. As such rolled drawings are accumulated, it becomes exceedingly inconvenient to keep them for easy reference. The customary way is to stack the rolls in any out-of-the-way space that seems available. As a result such rolled drawings quickly deteriorate, thus impairing their usefulness.

By means of the invention each drawing may be formed into a convenient roll and placed in a container, the interior of which has a circular configuration while the exterior is made up of angularly intersecting sides so the individual units may be formed into compact self-sustaining stacks thereby keeping the drawings indefinitely in satisfactorily useable shape.

A convenient way of constructing the apparatus of the invention is to encase a cylindrically configurated inner tube within a container having intersecting walls, preferably at right angles to one another. The inside surfaces of the walls of the container are tangentially in contact with the outer cylindrical surface inner tube.

The container preferably is greater in length than the tubular insert, the container being provided with a tight closure at one end and a suitably disposed flap or door at the other end. An advantage of making the tubular insert of less length than its container gives a convenient clearance space at the four perimetral corners so a user can insert the thumb and forefinger in removing a rolled record from its container.

By means of the invention it becomes possible to make use of limited spaces in offices or drawing rooms for filing documents, which spaces otherwise might be wasted. The rectangular outside configuration of the multiplex tubes makes it possible to build the individual multiplex units into substantial stacks, which take the place of ordinary filing cabinets. The doors or flaps of the multiplex containers provide spaces for labels on which is designated the documents contained in any particular multiplex compartment.

The forming of the individual multiplex tubular units may be facilitated by coating marginal ends of the outer tubular member with a pressure-sensitive adhesive substance which has eversticky properties. In commercializing the invention, it is the intent to coat one or both marginal ends of the portions thereof with the eversticky substance and to cover the substance with a protective strip or band of suitable material, such, for example, as textile or waxed paper. This protective strip or band is to remain on the multiplex unit until such time as a number of the tubes are to be assembled into a stack or cabinet.

In the accompanying drawings, which illustrate an excellent embodiment of the invention,

Fig. 1 represents a side elevation of an individual multiplex unit of typical construction;

Fig 2, a front end elevation thereof;

Fig. 3, a cross-section taken on the line 3—3 in Fig. 1;

Figs. 4 and 5, cross-sections corresponding to Fig. 3, but illustrating alternative details;

Fig. 6, a perspective view of an individual, multiplex tubular unit arranged for stack formation;

Fig. 7, a perspective view of a plurality of the multiplex tubes associated with one another to form a stack or composite cabinet;

Fig. 8, a fragmentary side elevation, partially in vertical section and drawn to an enlarged scale, showing alternative details;

Fig. 8A, the same as Fig. 8 after the removal of a portion of the original structure;

Fig. 9, a view in perspective, showing formative steps following the step illustrated in Fig. 8A;

Fig. 10, a vertical section taken on the line 10—10 in Fig. 8; and

Fig. 11, an end elevation after completion of the steps of Figs. 8 and 8A.

Referring to the drawings, the numeral 20 designates a tube made, for illustration, of pasteboard rolled into one or more layers to form a composite tubular wall 20. If desired, the wall 20 may be formed of helically rolled strips pasted together in a manner that is well known. Encasing the tube 20 is a container 21, the walls 22 of which are preferably plane and intersect one another, for example, at right angles, leaving the vacant, angular spaces 23 at the four corners. The inner surfaces of the walls are preferably tangent to the outer cylindrical surface of the tube 20 and fastened thereto by means of a pressure-sensitive or other adhesive coating 24.

In Fig. 3, two outer container walls are brought into conjunction at 25, and are held together by means of a flexible strip 26, the strip being made of any suitable material such as a coarsely woven textile pasted over the corner portions by means of any suitable adhesive.

In Fig. 4, the marginal portion 27 forms a flange depending from one of the plane walls 28 of the outer container, the flange 27 being adapted for fastening to the wall 28 by any suitable means, such as an adhesive tape 29, or staples 30, or both.

In Fig. 5, the container walls are composed of two layers of pasteboard 31 and 32, the contacting surfaces of which may be united to each other by means of an adhesive. The marginal portions of the layers at a closing corner 33 may be fastened together by a strip of coarse textile or other material, to form the marginal portions 34 and 34*a*. These marginal portions may be adhesively fastened to the outer surfaces of the container walls, as indicated at 35.

To provide structural strength for the one head, in this instance the one at the rear of the container 21, portions of the upper walls and portions of the lower walls, may form respective leaves 36, while portions of the two side walls may form leaves 37. The leaves 37 may be folded to overlap against the leaves 36 so that any suitable adhesive applied to the common contacting surfaces of the leaves 36 and 37 results in the formation of a substantial end wall.

As a convenience for removing rolled items from the tube 20, one end 20*a* of the latter may be spaced inwardly any suitable distance 38 from the end 22*a* of the container, thereby leaving the corner spaces 23 less in length so that the inside space of the container, for a distance such as 38 is available for conveniently grasping the end portion 39 of any rolled sheet, which extends

beyond the end 20*a* for withdrawing the same from the tube 20.

A door 40 at the open end 22*a* of the container 21 is provided for access to the contents of any multiplex tube. The door 40 may be hinged at 41 and may have a top marginal portion 42 for slipping under the top wall of the container. A flexible fastening 43, such as a string or ribbon, may be attached to the upper wall of the container and be adapted for wrapping around a means such as fastener button 44 of the door 40. For conveniently opening the door, a finger hole at 40*a* may be provided.

Provision may be made for conveniently varying the length of any multiplex tube as illustrated in Figs. 8 to 11. For this purpose the tube 20 may be perforated, as indicated at 45, which permits the separation from the original length of any desired portion such as 46, Fig. 8, to suit individual requirements. At the same time the container walls 22 may be scored at a corresponding girth line 47 so as to allow the formation of new leaves 36*a* and 37*a*. The leaves 37*a* are coated with a pressure-sensitive substance 51 on the inside surfaces thereof, these surfaces being normally protected by strips 52 of paper, or other material, until ready for use.

In the alternative construction the leaves 36*a*, Fig. 9, may be bent inwardly into the closing position indicated in Fig. 11 and similarly the leaves 37*a* may be bent to overlap the leaves 36*a*, thereby causing the respective pressure-sensitive coatings 51 to come into aligning contact with each other to form the finished end construction of Fig. 11.

An example of forming the individual multiplex tubular units into self-sustaining stacks, as hereinbefore touched upon, is illustrated in Fig. 7. The step of preparing the individual units for stacking is illustrated in Fig. 6, where a limited outside marginal portion of the perimeter of the container 21 is coated with adhesive 48, preferably pressure-sensitive adhesive, this coating being normally covered by a protective band 49. As shown, the ends 50 indicate a step in the removal of the protective band.

In assembling the prepared individual multiplex units into self-sustaining stacks, the protective band is removed from one or more of the outer faces of the marginal portions as may be required by the particular position occupied by the unit in a stack. For example, in building a stack, the corner units would have the protective band removed from the two margins facing inwardly of the stack, while the individual units between corners would have the band removed from three inner faces. Individual units occupying positions in the interior of the stack would have the band removed on all four outer marginal faces.

The present combination is novel in that it eliminates the disadvantages of using either a circular tube alone, or a square tube alone. In the case of the circular tube, alone, satisfactory stacking is impossible while the removal of a rolled sheet from the tube is difficult. The disadvantage of the square tube alone is that it is subject to distortion because the square in itself has no inherent stability to prevent its collapse.

A square tube alone also permits contained paper sheets after a time to tend to assume the shape of the tube thereby interfering with flattening of the unrolled sheets.

A square tube, further has the objection that it lacks the frictional contacting surface to keep a rolled sheet from sliding back and forth in the tube, thus tending to damage end portions of a rolled sheet.

In its broadest sense, the term "multiplex" is here used to indicate the different character of the inner receiving surface as against the outer stacking surface, and vice versa, of the tubular receptacle of the invention. While certain presently preferred structural forms of such receptacle are here specifically illustrated and described, it should be realized that many other types of construction and materials may be preferred from time to time for one reason or another by those skilled in the art, and may be adopted without departing from the essential concepts and teachings hereof.

For example, the body structure of the receptacle may be formed to required inner and outer configuration from plastic and other materials; the pressure-sensitive adhesive may be replaced by ordinary dry gum adhesive requiring moistening to become sticky; the exterior adhesive may be replaced by other means for fastening one receptacle relative to others in the stacking of a plurality of same for storage purposes.

Accordingly, the scope of my invention is defined primarily by the claims which here follow.

What is claimed is:

1. A multiplex storage receptacle for rolled sheets, comprising an inner tubular member of cylindrical configuration; an outer tubular member polygonal in cross-section whose walls comprehend the length of the inner tubular member and tangentially contact the outer surface thereof along its entire length, both of said tubular members being formed of paperboard material and the length of the inner tubular member being less than the length of the outer tubular member; means attaching said tubular members to each other along tangentially contacting portions thereof; and closures at respectively opposite ends of said multiplex tube construction, at least one of said closures opening to afford access to the interior of said inner tubular member over the entire cross-sectional area thereof.

2. A storage receptacle according to claim 1, wherein the means attaching the walls of the two members together comprises an adhesive medium disposed along the tangentially contacting portions of the tubes.

3. A multiplex tube construction comprising an inner tube having a cross section of closed curvature; an outer tube at least partially in contact with the inner tube along longitudinal elements thereof; an initial closure in common at one end of both tubes; and means for shortening the multiplex formation, said means for shortening including a line of perforations extending around the periphery of the inner tube in spaced relation to the initial closure thereof; means for forming the end of the outer tube adjacent the line of perforation into an assemblage of overlapping leaves; and means for adhesively connecting the overlapping leaves to one another along contacting surfaces thereof.

4. A multiplex storage receptacle unit for storing rolled sheets, comprising structure defining an inner tubular surface having closed curve configuration in cross-section and an outer tubular surface polygonal in cross-section, said structure including closures at respectively opposite ends thereof, at least one of said closures opening to afford access to the interior of said receptacle over the entire cross-sectional area of the interior thereof, and that end of said structure having the specified access closure being recessed inwardly, shortening the inner tubular surface relative to the outer tubular surface.

5. The combination set forth in claim 4, wherein fastening means are provided at the periphery of the outer tubular surface.

6. The combination set forth in claim 5, wherein the inner tubular surface is cylindrical and the outer tubular surface is square in cross-section.

7. A storage cabinet, comprising a plurality of multiplex tube receptacles, each as set forth in claim 4, the said receptacles being stacked in mutual contiguity; and means fastening contiguous receptacles to one another.

8. A storage cabinet, comprising a plurality of storage receptacles of multiplex tube construction, each being made up of a cylindrical inner tube of paperboard material, an outer tube also of paperboard material and having polygonal cross-section and enclosing the cylin-

drical tube in tangentially contacting relationship along substantially the entire length thereof, and opposite end closures, at least one of which opens to afford access to the interior of said inner tube over the entire cross-sectional area thereof, the said plurality of storage receptacles being stacked vertically in successive horizontal tiers; and fastening means securing said storage receptacles in such stacked relationship.

9. A multiplex tube unit according to claim 4, in which said structure includes inner and outer tubular members, the inner tubular member being enclosed for at least the major portion of its length by said outer tubular member and being generally cylindrical in cross-section and defining said inner tubular surface, and the outer tubular

member being polygonal in cross-section and defining said outer tubular surface.

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