April 1, 1958 R. MacKAY 2,828,857

SHIPPING CONTAINER FOR PRINTING CYLINDERS

Filed March 25, 1954 2 Sheets-Sheet 1

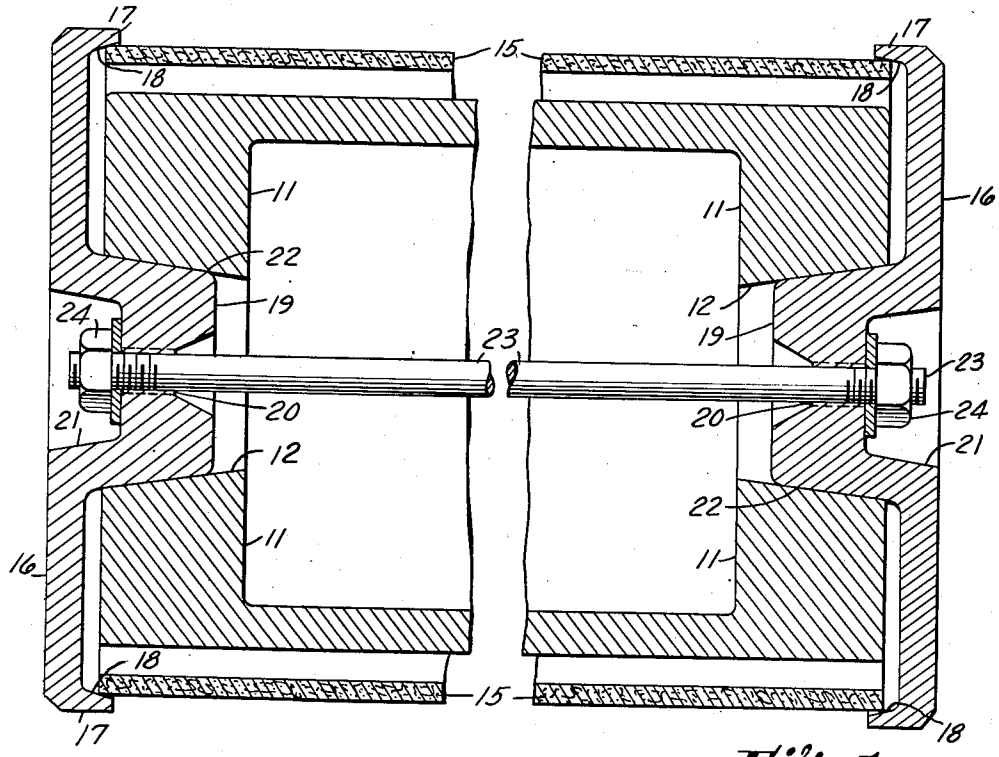


Fig. 1

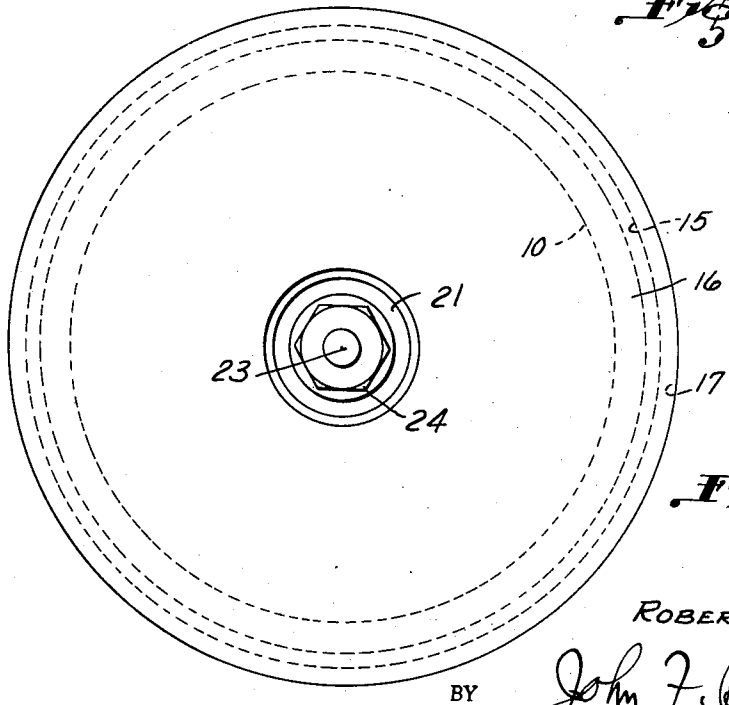


Fig. 2

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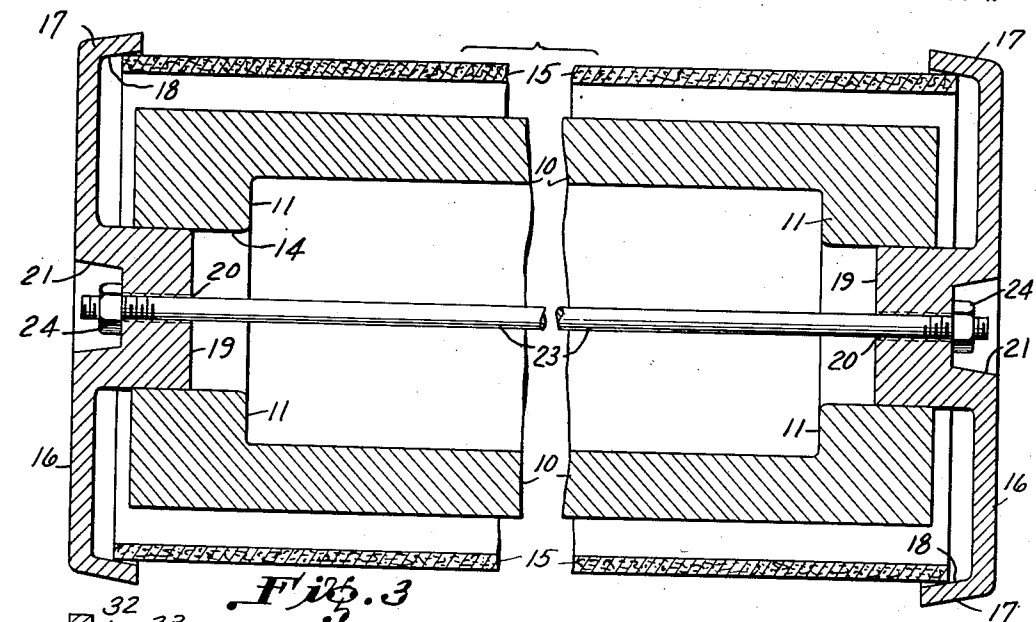


Fig. 3

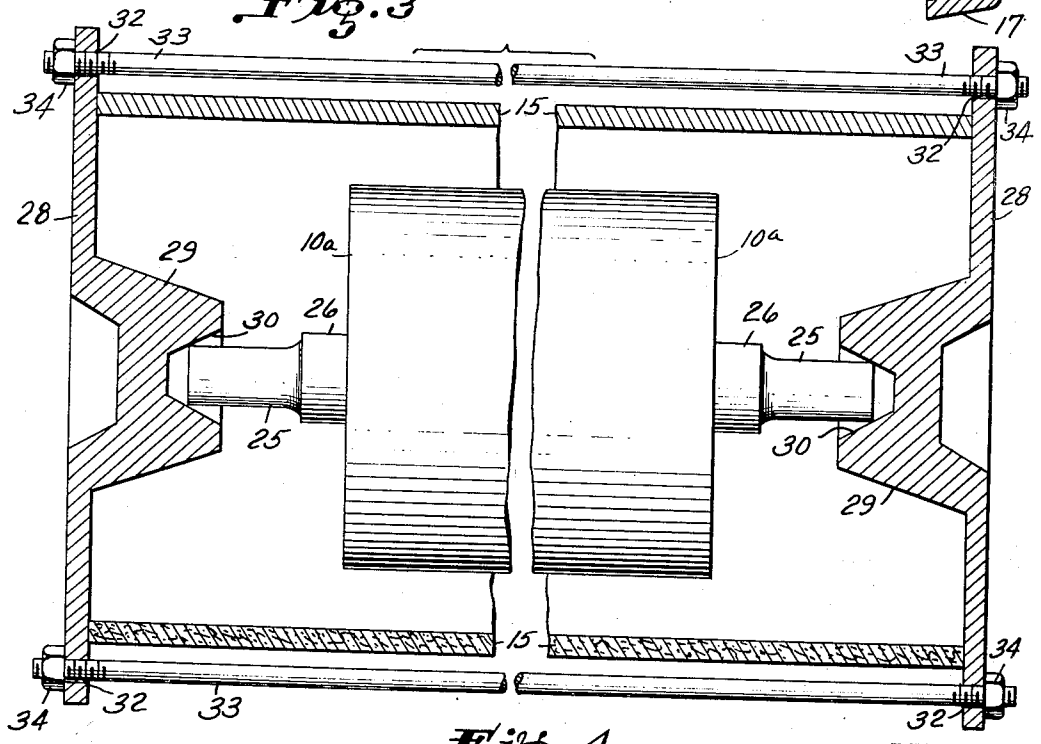


Fig. 4

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SHIPPING CONTAINER FOR PRINTING CYLINDERS

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Application March 25, 1954, Serial No. 418,595

1 Claim. (Cl. 206—46)

This invention is directed to a shipping and transportation container of novel construction adapted especially for use in packing, shipping, and transporting cylinder bases and cylinders used in rotogravure and engraving presses.

In the field or rotogravure printing, engraving and color printing, presses are utilized in which the printing cylinders have the engraving etched thereon.

As the process of completing the etchings of such printing cylinders is costly, resulting in a very fragile etching face, it is extremely important that the etched faces of the printing cylinders be completely protected against impact during shipment and transfer from the places where same are produced until the same are adjacent the press or presses into which such printing cylinders are to be mounted preparatory to running the actual jobs.

Failure to exercise an exceedingly high degree of care during transport of printing cylinders from the point of preparation to the location of the customer's press has frequently caused damage to etched printing cylinders, which has necessitated the costly complete duplication and reproduction of the etching as well as the costly "down" time for large and expensive presses. These factors have sought to be overcome by packing such etched cylinders into large and heavy wood boxes provided with some block means in the ends of such boxes to engage the gudgeons or shafts of the cylinders to maintain the etched faces of the printing cylinders out of contact with the walls of the boxes. This has been unsuccessful in numerous instances due to damage caused by parts of the box which have been broken or caved in due to contact and striking a part of the cylinder face. Additionally, such heavy boxing has a disadvantage of great weight and thereby greatly increasing the gross shipping weight and cost of transportation, in addition to being very costly from a material and assembly standpoint.

It is, therefore, an important object and accomplishment of my invention to provide a novel relatively light and compact container of great strength and durability and which has novel structural features providing for its quick and easy assembly about conventional printing cylinders which normally either has a central longitudinal passage therethrough or which are provided with end openings such as illustrated.

It is a further object of my invention to provide a relatively light, portable substantially cylindrical container for protecting and transporting printing cylinders which includes a tubular or rounded wall of relatively rigid sheet or fibrous material, and a pair of end plates or caps having integral peripheral flanges adapted to seat about and envelop the opposite ends of said cylindrical wall, and which end caps or covers each have an integral centrally passaged hub whose outer face is adapted to releasably impinge and seat in one of the flared or conical end faces defined by an end passage in the printing cylinder, and which said container has a releasably

mounted connecting or tie rod normally passing through the two end caps of the container to securely hold the end caps against the opposite ends of the cylindrical side wall, and which rod holds the printing cylinder centrally in the container and with the etched printing cylinder face spaced from the side walls of the container.

A further object of my invention is to provide novel shipping and transporting containers for etched cylinders and for cylinder bases which have stub shafts projecting from their opposite ends and which are of the type referred to in preceding paragraph, and which have centrally recessed end caps whose recesses are adapted to receive the end portions respectively of the oppositely projecting shafts in the cylinders, said end caps having suitable means for releasably holding same and thereby holding a cylinder in the central portion of the container.

Other and further important objects of my invention will be apparent from the following specification and claim. This invention, in preferred forms, is illustrated in the accompanying drawing, bearing numerals of reference contained in the specification.

Fig. 1 is a cross-section view with intermediate parts broken away, taken on a longitudinal central plane and illustrating the structural features of my novel re-usable container for etched cylinders and the like.

Fig. 2 is an end elevation looking at the exterior of said container.

Fig. 3 is a cross-section view, with parts broken away, and illustrating a modified form of my container adapted for use in connection with printing and etching cylinders having substantially cylindrical holes at the opposite ends thereof.

Fig. 4 is a cross-section view, with intermediate parts broken away, of a modified form of my invention adapted for carrying, protecting and transporting printing and etched cylinders having oppositely extending shafts in the ends thereof.

Referring to Figs. 1 and 2, numeral **10** designates a cylinder base or an etching or printing cylinder adapted for printing and which is made of suitable metal. Such cylinders **10** have inwardly extending integrally formed gudgeons **11** formed during the casting or molding process, and each gudgeon **11** formed at each end of etching cylinder **10** defines a round hole or passage of substantial size which may be either of frusto-conical shape and designated as **12** in Fig. 1, or may be of cylindrical shape of the type illustrated in Fig. 3 and designated by numeral **14** in Fig. 3.

Both of the aforesaid types of cylinders are used in presses of different types, depending upon the manufacturer. In mounting such cylinders into the presses themselves, and into rotatable engagement with the bearings thereof, steel shafts having enlarged butt portions corresponding to the shape and size of the holes **12** or **13** are firmly though removably mounted in either the conical holes **12** or in the cylindrical holes **13**, according to the particular type of press being used. Such stub shafts not shown in the drawings project a short distance from the opposite ends of the printing cylinder and these shafts are suitably located for rotation in suitably spaced bearings forming part of the press. If it is desired to remove a used printing cylinder, the bearing mechanisms are released and the cylinder and end shafts are removed, whereupon the end shafts with their integral hubs or butts are removed, and the cylinder is then transported to the place where the former etching is removed and thereafter such cylinders are re-plated with copper and new etchings are reproduced upon the suitably prepared copper faces thereof.

The production of new etchings and engravings upon cylinders is in most cases done by firms located at a

substantial distance from the printing establishments, and consequently the shipping of said cylinders to the engravers and from the engravers back to the printing establishment is necessary and has necessitated the packing of such cylinders in heavy and expensive boxes with expensive means for maintaining the cylinders out of contact with the interior faces of the boxes so that no damage whatever will result to the etchings and engravings on the cylinders themselves. In transporting cylinders and cylinder bases which have been utilized it should be borne in mind that they are relatively heavy and in the case of larger cylinders weigh up to approximately 500 pounds. The relatively great weight of the cylinders accordingly has heretofore required relatively heavy boxes and packing means to avoid damage during handling and transportation.

Referring to the drawings, numeral **15** designates an elongated cylinder, shell or casing of relatively hard and stiff pressed fibre, and these container cylinders **15** are made in varying lengths and corresponding substantially to the wide range of lengths of printing cylinders and bases which are customarily used in presses, these lengths of cylinders usually ranging from 12 to 60 inches. The interior circumference and dimension of casings **15** is such that it is greater than the circumference of the cylinder to be enclosed and packed within the same. In other words, the container cylinders **15** are formed in a wide range of sizes both as to diameter and as to length so as to receive the varying sizes of printing cylinders which are conventionally utilized and so that a substantial space will remain between the container cylinders and the particular printing cylinders which are to be enclosed therein.

Numeral **16** designates metal end caps having integral angularly extending peripheral flanges **17** whose inner annular faces **18** are bevelled and gradually reduced toward their outer edges.

Each of the end caps or end plates **16** carry centrally apertured hubs or bosses **19**, each of which has a central hole or passage **20** therein. Each of the hubs **19** has countersunk recesses **21** opening to the normally outer face of the end cap, and each of said hubs **19** preferably also has an inner annular recess **21** which is coaxial to the axis of the hole or passage **20**.

As shown in Fig. 1 the outer annular face **22** of the hubs **19** is frusto-conical and formed so as to normally present a gradually reduced face which will releasably engage and seat in the end opening of the printing cylinder so as to thereby center the end caps with the printing cylinder coaxially.

It would be understood that the dimension of each pair of end caps **16** is substantially greater than the corresponding dimension or diameter of a cylinder to be enclosed in the particular container, and so that the rigid container cylinder or casing **15** will be maintained in spaced apart relation to the etched face of the cylinder to be enclosed.

The size of a particular pair of end caps **16** is such that the annular faces **18** of the flange **17** are frictionally engaged and impinge the opposite end edges of the container cylinder **15** in the manner illustrated when the caps are mounted as described.

Numeral **23** designates a connecting rod or bolt of suitable size which is removably positioned through the center of a printing cylinder, the printing cylinder then being positioned within a container casing **15**, and thereupon the opposite end caps **16** are mounted in position so that the respective hubs **22** will fit tightly within the end holes respectively of the printing cylinder. Thereupon a pair of nuts **24** are threaded and tightened upon the ends of the rod or bolt **23**, preferably after first mounting a suitable flat washer about the opposite ends of the rod or bolt **23** substantially as illustrated.

A preferred manner of mounting and packing a particular printing cylinder within my said novel container is to first insert the connecting bolt or rod **23** into the passage of one of said end caps **16** and mount the nut **24** by threading it, and then setting the first end cap upon a floor or other supporting surface. Thereafter the printing cylinder may be lowered length-wise to cause seating engagement between the hub and the lower end shaft and the lower end opening of the hub of the end cap, whereupon the container cylinder **15** of the proper size is lowered into seating engagement with flange **17** of the lower end cap. Thereupon the opposite and upper end cap **16** is slipped upon the upper end of rod **23** and the second end cap **16** is seated against the opposite and upper end of the container cylinder and the opposite and other nut **23** is threaded and tightened tightly so as to impinge the container cylinder **15** firmly between the respective flanges of said metal end caps **16**. It will be understood that thereby the printing cylinder will be maintained centrally within said container so that its printing face will be maintained in spaced apart relation with respect to the cylinder container wall, and it will be further understood that upon arrival at destination the said cylinder may be removed without damage after removing one of the nuts **24** and one of the end caps **16**, preferably by lifting the same upwardly when the container is standing upon one of its ends.

Referring to Fig. 3 it will be noted that a different style of printing cylinder **10***a* is illustrated and which has two cylindrical holes **13** in its integral end gudgeons **11**. In connection with this type of printing cylinders, I employ end caps **16** having hubs **19***a* of substantially cylindrical shape and each having an outer cylindrical face of a size which will fit snugly into the end opening or hole **13**. The mounting of the printing cylinder **10***a* is similar to that previously described with respect to Fig. 1, and it will be understood that such printing cylinder will be held firmly within the disassemblable container until its manual removal.

In Fig. 4, I have illustrated end portions of another type of printing cylinder in which a pair of end or stub shafts **25** having integrally formed enlarged shank portions **26** are mounted in the opposite end openings respectively, either removably or permanently, of the printing cylinder **10***a*.

In connection with such printing cylinders which have oppositely extending end shafts thereon, I have provided a pair of metal end caps **28** whose integral central hubs **29** are provided with tapered recesses **30** as illustrated in Fig. 4 coaxial with the central openings **31** of said end caps. Said recesses **30** are adapted to have the end portions of the end shafts of the printing cylinder seated therein respectively and as illustrated in Fig. 4.

Each of the end caps **28** have a plurality of holes **32** formed in its periphery and in spaced apart positions. Preferably four such holes **32** are formed in the periphery of each end cap and in positions which will be exteriorly of the cylindrical container wall **15** which is normally mounted between the opposed faces of a pair of said end caps **28**. A plurality of threaded bolts, ties or connecting rods **33** of suitable length are removably mounted in the correspondingly positioned holes **32** of the opposed end caps **28**, and nuts **34** are threaded and tightened on the bolts **33** on the outside of said end caps so as to impinge the end caps firmly against the opposite ends of the container wall **15**. This will result in the shaft-bearing printing cylinder, of a size smaller than the interior of the chamber of cylindrical wall **15**, to be held in central position within the container and fully protected against damage during handling and transport.

The invention has been described more or less as to details, yet it is to be understood that the invention is not to be limited thereby, as changes may be made in the arrangement and proportion of parts and equivalents may be substituted without departing from the spirit and scope of the invention.

I claim:

In combination a printing cylinder and a reusable disassemblable container therefor consisting of a rigid outer cylindrical container wall of greater circumference than the cylinder to be enclosed therein; a pair of metal end caps of substantially cylindrical form, each of said end caps comprising a centrally passaged transversely projecting integral hub, an integral flat extending from said hub and an integral transversely extending peripheral flange providing a gradually tapered annular face facing toward the hub, said end caps being normally mounted on opposite ends of said container wall with their peripheral flanges enveloping and impinging the outer opposite ends of said container wall respectively and their flats being outwardly spaced from the ends of the container wall respectively; a hollow cylinder base within said container wall and having a pair of opposed inwardly extending gudgeons, the bore of said gudgeons

being of smaller diameter than the diameter of the cylinder hollow, a portion of said hubs extending into said gudgeons respectively, said gudgeons impinging on the entire outer surface of the hub portions therein disposed; an elongated connecting rod releasably mounted in the passages of said end caps, and securing elements releasably mounted on the opposed ends of said connecting rod and engaging said hubs respectively and by securance of which said hubs are driven into said gudgeons.

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