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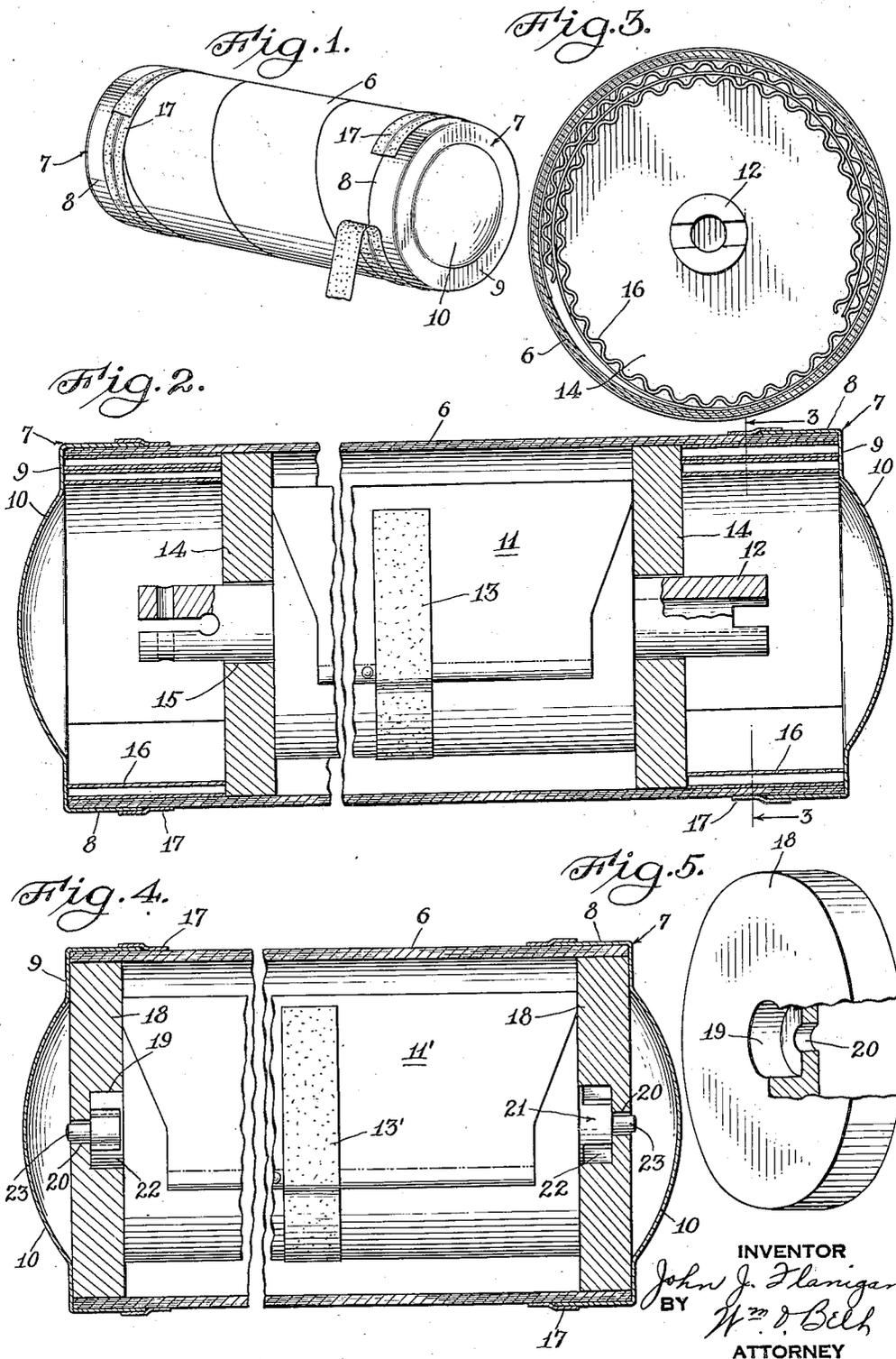
J. J. FLANIGAN

1,983,278

CONTAINER

Filed June 21, 1933

2 Sheets-Sheet 1



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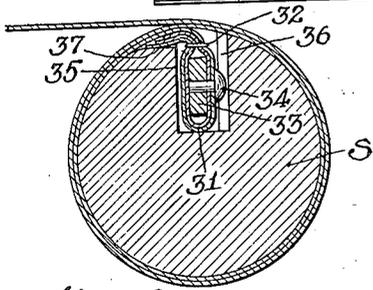
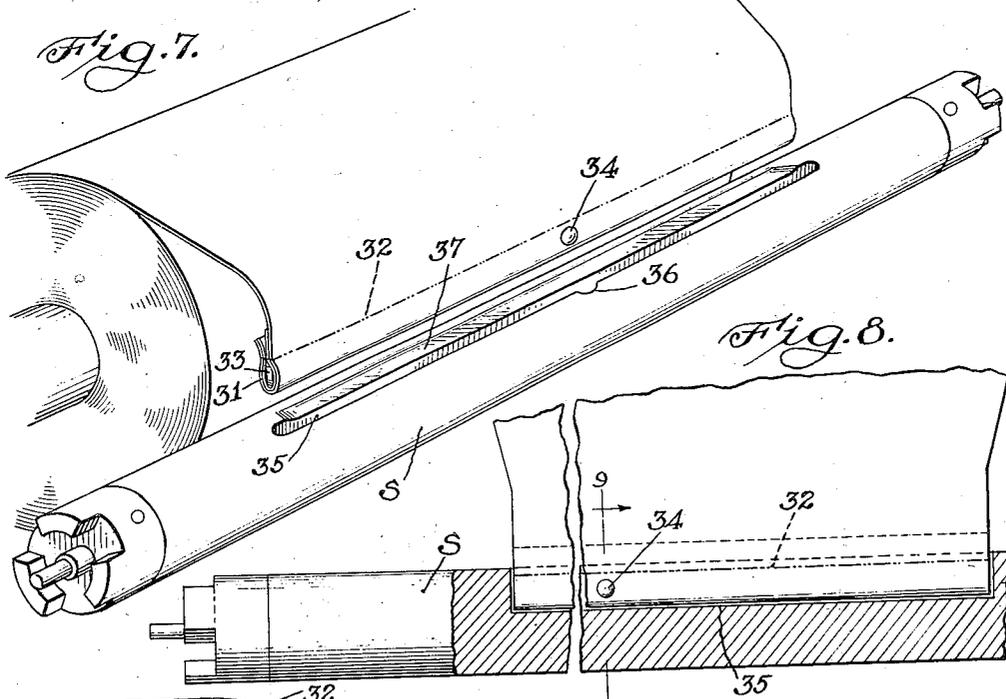
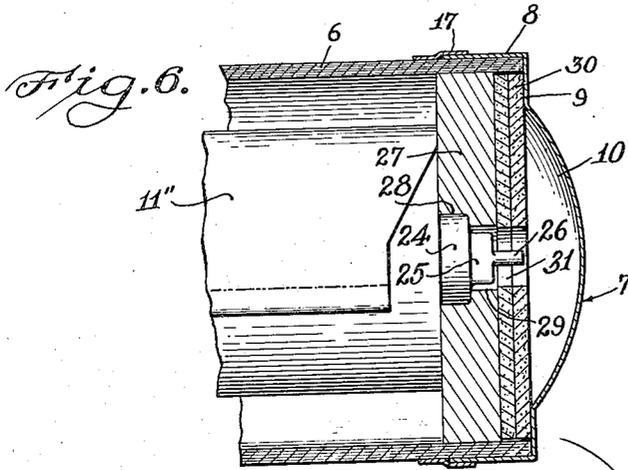
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J. J. FLANIGAN
CONTAINER

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

1,983,278

CONTAINER

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Application June 21, 1933, Serial No. 676,825

20 Claims. (Cl. 206—52)

This invention relates to the storing and shipping of gelatin band rolls for hectograph duplicating machines or other articles which are subject to deterioration when exposed to the atmosphere for an extended period and which may be easily damaged. Hectograph bands comprise a layer of gelatin supported on a suitable backing and are wound upon spindles into rolls. It is important that the face of the hectograph band should be smooth, continuous and unbroken and that the uniform thickness of the band both longitudinally and transversely should be maintained to provide a satisfactory duplicating surface. The rolls must be handled carefully to avoid damage to the gelatin layer and before being put in use they should be protected against atmospheric changes and other detrimental conditions to which they would be subjected if freely exposed in shipping and in storing. A roll comprising a gelatin band fourteen feet six inches in length and fourteen inches in width for a standard machine for office work and wound upon a light wood spindle weighs about seven and one-quarter pounds, and it will be readily understood that a roll of this size and weight may be easily damaged in shipping and handling and therefore requires careful protection. A freshly made gelatin band contains a certain amount of moisture. Moreover, such a band is highly hygroscopic and absorbs moisture from the air in damp humid atmosphere and gives up moisture in a dry atmosphere such as a steam heated room. It is therefore important that the band be protected against atmospheric changes so that the original moisture content thereof may be maintained substantially constant.

Important objects of my invention are to provide a container adapted to receive and support a gelatin band roll or other similar article in a manner which will protect the roll against deterioration and damage in handling, in shipping, and in storing and to provide a strong and substantial container capable of repeated use in the transmission of a gelatin band through the mails or for other purposes.

Gelatin band rolls may be stored for many months before use and another object of my invention is to provide an effectively sealed container which will maintain the gelatin band in its original condition so that the band may be stored for a relatively long time without deterioration.

Another object of the invention is to effectively secure the removable parts of the con-

tainer in position to prevent displacement thereof in the handling, shipping, and storing of the container, and ancillary objects are to seal the removable parts against leakage and to enable removal of the seals without damage to the containers.

Gelatin bands are customarily furnished in standard sizes of varied widths, and sometimes of varied lengths, and are wound on spindles of different types. A further object of my invention is to provide containers of standard size and construction for shipping and storing varied sizes of gelatin band rolls wound on different types of spindles and to so support the rolls in the containers that relative movement of the rolls and containers is prevented.

Still further objects of the invention are to so form the containers that improper positioning thereof, which would be likely to damage the rolls, will be prevented; to provide inexpensive supports for accommodating different types of spindles; and to utilize readily available materials as spacers for positioning and retaining the supports and the rolls in the containers.

The sizes of gelatin bands are standard, that is to say, they are made in predetermined widths, but these bands are originally wound on different types of spindles particularly adapted for use in different styles of machines. It may be that a number of bands of the desired size are on hand but these bands may be wound upon spindles of a type other than the kind required by the use to which the bands are to be put, that is to say, the spindles may not be adaptable for the type of machine in which it is planned to use the bands. It is therefore still another object of my invention to provide identical connectors at opposite ends of the bands and to provide cooperating portions on the spindles to receive these connectors so that a band may be readily unwound from one type of spindle and wound onto another.

Further objects of the invention are to accurately center the bands on the spindles; to prevent the formation of a bulge or shoulder when the band is wound on the spindle; and to prevent the formation of ridges or other unevenness in the duplicating surfaces of the bands by eliminating grooves or pockets in the parts of the spindle with which the gelatin bands directly contact.

In the selected embodiment of my invention illustrated in the accompanying drawings

Fig. 1 is a perspective view;

Fig. 2 is a vertical longitudinal sectional view;

Fig. 3 is a transverse sectional view taken substantially on the line 3—3 on Fig. 2;

Fig. 4 is a view, similar to Fig. 2, but showing a different type of spindle and a modified use of the container;

Fig. 5 is a perspective detail view of one form of spindle support;

Fig. 6 is a fragmentary view, similar to Figs. 2 and 4, but showing still another type of spindle and a further modified use of the container;

Fig. 7 is a perspective view illustrating the manner in which the end of a band is connected to a spindle;

Fig. 8 is a fragmentary detail view, partly in section, showing the end of the band connected to a spindle; and

Fig. 9 is a transverse sectional view taken substantially on the line 9—9 on Fig. 8.

The illustrated form of container comprises a plurality of laminations formed of strips of heavy paper or the like spirally wound to provide a cylindrical tube 6 embodying squared ends and having the seam of each lamination breaking joint with the seams of adjacent laminations for this increases the rigidity of the tube and prevents leakage through the wall thereof. The inside of the tube is preferably coated with paraffin or other waterproofing substance.

The squared ends of the tube are closed by removable caps, generally indicated by 7, which include flanges 8 adapted to tightly embrace the periphery of the tube. The caps have flat ends which are bulged outward medially thereof, as indicated at 10, and these bulges are rounded. When the caps are properly installed, the flat marginal sections 9 of the caps firmly engage the adjacent ends of the tube.

In Fig. 2 I have illustrated a gelatin band 11 materially narrower than the length of the tube 6, and this band is wound on a spindle 12. A strip 13 of adhesive tape or the like overlaps and fastens the free end of the band to prevent unwinding thereof.

It is essential that the roll be held out of contact with the walls of the container to prevent damage to the band and to this end I provide narrow cylindrical supports 14 which are adapted to neatly fit in the tube 6. These supports 14 have centrally located openings 15 therein through which the projecting ends of the spindle 12 extend. The supports abut the ends of the roll and are uniformly spaced from opposite ends of the tube.

Spacers 16 bridge the gaps between the supports 14 and the adjacent ends of the tube to prevent relative movement of the roll and supports and the tube. These spacers are in the form of strips cut from suitable material. I prefer to cut the spacers from corrugated paper board in such a way that the corrugations will extend axially of the tube when the strips are arranged in contact with the inner surface of the tube with the edges thereof abuffed against the supports 14 and the flat marginal sections of the caps 7 for the rigidity of the spacers is increased by extending the corrugations axially of the tube. When the caps are fitted on the ends of the tube and the flanges tightly embrace the periphery of the tube, the spacers and, therefore, the supports and roll are firmly held in position.

The band contains the proper amount of moisture when it is packed in the container a short time after its manufacture and, when packed in a container such as that described, it may be

stored for a relatively long time without deterioration since the tube is substantially air-tight which prevents ingress and egress of moisture and consequently the proper humid condition is maintained in the tube and therefore the roll does not dry out nor absorb excessive moisture.

The thrust incidental to the handling of the container will be on the end caps and, to insure against displacement of these caps, strips 17 of adhesive tape or the like are wrapped about the tube to overlap the free ends of the flanges 8. These adhesive strips not only securely fasten the end caps in position but also insure against leakage since they seal the end caps. The strips 17 are so applied to the tube that they may be stripped therefrom in the direction of the lead of the outer of the spirally wound laminations of the tube so that when the strips are pulled off they will not tear the outer laminations from the adjacent underlying lamination and damage the container.

The spacers 16 are employed when the ends of the spindle project beyond the ends of the roll in an appreciable amount as illustrated, for example, in Fig. 2. When, however, the ends of the spindle do not project materially beyond the ends of the roll as illustrated, for example, in Fig. 4, the supports are positioned at the ends of the tube to abut both the ends of the roll and the flat marginal sections 9 of the caps. The supports 18, Figs. 4 and 5, are somewhat different from the supports 14 in that recesses 19 are provided in corresponding faces centrally of the supports 18. Axially located openings 20 extend from the bottoms of the recesses to the opposite faces of the supports.

The band 11', in Fig. 4, is wound on a spindle 21 and the free end of the band is retained by a strip 13' of adhesive tape or the like. The spindle 21 has end members thereon including driving lugs 22 and outwardly projecting axial studs 23. The driving lugs 22 are mounted in the recesses 19 and the studs 23 are extended through the openings 20 when the supports are abuffed with the ends of the roll. Such disposition of the driving lugs and studs and of the supports firmly holds the roll in the supports and as the supports are clamped between the ends of the roll and the caps 7, the roll and supports and the tube are held against relative movement which might damage the roll.

In Fig. 6 a still further modified use of the container is illustrated and herein the band 11'' is wound on a spindle 24 which includes flat diametrically extending driving lugs 25 and pins 26 which project axially from the outer edges of the driving lugs. In this instance circular supports 27 are provided which are somewhat different from both the supports 14 and 18 in that recesses 28 are provided in corresponding faces thereof which are adapted to receive metal end caps on the ends of the spindle 24. Axial openings 29 extend from the bottoms of the recesses through the opposite faces of the supports to accommodate the driving lugs 25 and the pins 26. The supports 27 abut the ends of the roll and the space, if any, between the supports and the marginal sections of the caps 7 is bridged by installing suitable spacers such as one or more washers 30 which may be provided with axial openings 31 to accommodate the driving lugs or pins, if necessary. The tube 6 and the caps 7 are constructed in the same manner as that previously described and the caps are retained in

position by adhesive strips 17 applied in the manner previously set forth.

It is to be understood that the spindles 12, 21 and 24 might be interchanged because the type of spindle does not depend upon the width of the roll but rather upon the construction and type of machine with which the band is to be used. The type of support which will be used in a particular instance will depend upon the type of spindle on which the band is wound and it is to be understood that the openings in the supports will be arranged to accommodate spindles of different constructions, the three illustrated forms being merely exemplary.

While the rolls may be packed in the described containers in any desired way, one manner in which this may be done is to first select a proper size of container and then fit a cap 7 on one end thereof. If the roll and spindle are such that the supports will not be disposed at the ends of the tube, as shown in Fig. 4, a spacer of proper width is installed in the tube adjacent the cap 7. Proper supports are then mounted on the spindle and are abutted with the ends of the roll. The roll and supports are then inserted into the tube and the innermost of the supports is engaged with the previously installed spacer. Another spacer is then positioned at the open end of the tube to bridge the gap between the adjacent support and the end of the tube and then the other cap 7 is fitted on the tube. After the cap 7 has been positioned to close the open end of the tube, the strips 17 are applied to secure the caps in position and, as stated, these strips also serve to seal the package. Of course, when the supports are located at the ends of the tube, no spacers are used and the supports are firmly clamped between the ends of the roll and the flat marginal sections of the caps.

If the container should be permitted to stand upright for an appreciable period, the roll would rest on one end which might tend to spread or otherwise mar this edge of the band. However, when end caps having rounded bulges are used, the container cannot be stood upright but must be laid down on its side. Consequently, the band will be supported on the spindle upon which it is wound and, when so supported, damage to the ends of the roll is prevented.

Bands packed in containers such as that which I have described, may be stored for a relatively long time without detrimentally affecting the bands. Consequently, stocks of bands so packed may be maintained at strategic points throughout the country so that users may be quickly supplied with bands upon demand. It may happen, however, that a number of bands of a given size will be in stock but that these bands will be wound on spindles other than the type called for by a particular order and consequently I have constructed the bands and spindles so that a band may be readily unwound from one spindle and wound on another in event this should be necessary. Moreover, when a band is mounted at one end of a duplicating machine and is stretched over the bed the free end thereof is connected to a take-up spindle, which may be permanently mounted in the machine or which may be an ordinary spindle installed for the purpose, and the band is adapted to be wound to and from such take-up spindle. In use, the band will eventually be wound on the take-up spindle which may then be removed from the machine. Then, if desired, the spindle

from which the band has been unwound may be removed and installed to serve as a take-up spindle. It is, therefore, apparent that in use and at other desired times the bands are wound from one spindle to another. Hence, it is necessary to connect opposite ends of the band to the spindles and it is for this reason that I make both ends of the band identical.

Preferably the end portions of the bands are tapered so that the free ends are narrower than the main extent of the band. Each narrow free end is folded upon itself to provide a hem 31 and the folded portions are stitched, as at 32, inwardly of the fold. A bar 33 is inserted into the hem. Midway of the ends of the hem, which will be the center of the band, a headed stud 34 is so installed that the head thereof projects on the top or gelatin side of the band.

The spindle S on which the band is to be wound has an axially extending slot 35 therein. Midway between the ends of the spindle a notch 36 is formed in one wall of the slot and the slot extends equidistantly on each side of this notch, that is to say, the ends of the slot are equally spaced from the ends of the spindle and the slot is but slightly longer than the hem 31. The periphery of the spindle is flattened to provide a land 37 at the edge of the slot opposite the wall in which the notch 36 is formed.

When a band is to be unwound from one spindle and wound on another, the free end thereof is brought into juxtaposition with the spindle on which the band is to be wound, that is to say, the take-up spindle, and the hem 31 is inserted into the slot 35 and the head of the stud 34 is disposed in the notch 36. Since the notch 36 is located midway between the ends of the spindle and as the headed stud 34 is located midway between the edges of the band, it is clear that the above described connection of the band to the spindle centers the band on the spindle. When the take-up spindle is rotated in the direction of the notch 36 after the hem 31 has been arranged in the slot 35, the free marginal portion of the folded section of the band providing the hem 31 rests on the land 37 and this free marginal section builds up the land to the diameter of the spindle so that the spindle is truly round, the land and the disposition of the free marginal section of the band thereon compensating for the fold in the band adjacent the hem and entirely eliminating any ridge or bulge. Therefore, no ridges or other objectionable unevenness are formed in the wound band even though it is stored for a relatively long time.

Since it is only necessary to install the hem 31 and the bar 33 therein in the slot 35 to connect the band to a spindle, it is clear that a readily detachable connection is provided and therefore a band may be quickly attached to one spindle and wound thereon from another and this may be done in order to wind the band on a different type of spindle or it may be done during use of the band in a machine. Since the stud 34 and the notch 36 accurately center the band on the spindle, it is easy to uniformly wind the band on the spindle. Moreover, since the slot 35 is substantially co-extensive with the hem 31, there are no recesses or pockets in the surface of the spindle into which the gelatin might tend to flow and hence the surface of the gelatin band is kept smooth and uniform.

I have illustrated and described a preferred embodiment of my invention and I have also

- described a particular use thereof but it is to be understood that variations and modifications may be made in the construction of the container, particularly to adapt it for a different use, and it is to be understood that the connection between the band and the spindle may be varied for the interconnection may be used in connection with bands handled in any approved way and bands having any type of connection may be stored in my novel and improved container. Therefore, I do not wish to limit this invention to the details set forth but desire to avail myself of such changes and alterations as fall within the purview of the following claims.
1. I claim:
1. In a container for packaging a duplicating machine or similar band that is wound on a spindle having the ends thereof extended beyond the sides of the wound band, the combination of a tube adapted to receive the wound band and the spindle, supporting members mounted in said tube and having openings therein to receive the extended ends of the spindle to support said wound band in the tube out of contact with the tube, said supporting members being engaged with the sides of the wound band, and means for retaining said supporting members in supporting position and in engagement with the sides of the wound band and including a cap adapted to close one end of the tube, said cap being fast on the tube to prevent displacement thereof from the tube.
 2. In a container for packaging a duplicating machine or similar band that is wound on a spindle having the ends thereof extended beyond the sides of the wound band, the combination of a tube adapted to receive the wound band and the spindle, supporting members neatly fitted in said tube adjacent the ends thereof and having openings therein to receive the extended ends of the spindle to support said wound band in the tube out of contact with the tube, said supporting members being engaged with the sides of the wound band, closure means fast on the tube and closing an end thereof, and spacing means disposed between the adjacent supporting member and said closure means to retain said supporting member in supporting position and in engagement with the side of the band.
 3. In a container for packaging a duplicating machine or similar band that is wound on a spindle having the ends thereof extended beyond the sides of the wound band, the combination of a tube adapted to receive the wound band and the spindle, supporting members having centrally located openings therein through which the extended ends of said spindle are passed whereby said supporting members may be engaged with the sides of the wound band, said supporting members neatly fitting in said tube to support said wound band out of contact with the tube, caps mounted at the ends of the tube and closing the same, and spacing means extending between each of said caps and the adjacent supporting member to retain said supporting members in supporting position and in engagement with the sides of the wound band.
 4. In a container for packaging a duplicating machine or similar band that is wound on a spindle having the ends thereof extended beyond the sides of the wound band, the combination of a tube adapted to receive the wound band and the spindle, supporting members having centrally located openings therein through which the extended ends of said spindle are passed whereby said supporting members may be engaged with the sides of the wound band, said supporting members neatly fitting in said tube to support said wound band out of contact with the tube, caps mounted at the ends of the tube and closing the same, and spacing means comprising strips mounted in said tube between said supporting members and said caps and of a width sufficient to bridge the space between each cap and the adjacent supporting member whereby said strips retain said supporting members in supporting position and in engagement with the sides of the wound band.
 5. In a container for packaging a duplicating machine or similar band that is wound on a spindle having the ends thereof extended beyond the sides of the wound band, said spindle having end members on the ends thereof, the combination of a tube adapted to receive the wound band and the spindle, supporting members mounted in said tube and having openings therein to receive the end members on the spindle whereby said supporting members may engage the sides of the wound band, and means for retaining said supporting members in supporting position and in engagement with the sides of the band and including a cap adapted to close an end of the tube, said cap being fast on the tube to prevent displacement thereof from the tube.
 6. In a container for packaging a duplicating machine or similar band that is wound on a spindle having the ends thereof extended beyond the sides of the band, said spindle having end members on the ends thereof including connecting parts and guiding parts, the combination of a tube adapted to receive the wound band and the spindle, supporting members in said tube and having recesses therein to receive the connecting parts of the end members and having openings therein through which the guiding parts of the end members may be extended whereby said supporting members may be engaged with the sides of the wound band, and means for retaining said supporting members in supporting position and in engagement with the sides of the band and including caps adapted to close the ends of the tube, said caps being fast on the tube to prevent displacement thereof from the tube.
 7. In a container for packaging a duplicating machine or similar band that is wound on a spindle having the ends thereof extended beyond the sides of the band, said spindle having end members on the ends thereof including connecting parts and guiding parts, the combination of a tube adapted to receive the wound band and the spindle, supporting members in said tube and having recesses therein to receive the connecting parts of the end members and having openings therein through which the guiding parts of the end members may be extended whereby said supporting members may be engaged with the sides of the wound band, closure means fast on the tube and closing the ends thereof, and spacing means mounted between each of said caps and the adjacent supporting member and cooperating with said caps to retain said supporting members in supporting position and in engagement with the sides of the wound band.
 8. In a container for packaging a hygroscopic band that is wound on a spindle having the ends thereof extended beyond the sides of

the wound band, the combination of a tube embodying spirally wound laminated strips disposed one over the other to break the seams of the adjacent lamination, said tube being treated to prevent the passage of moisture there-through, supporting members mounted in said tube and having openings therein to receive the extended ends of the spindle to support said wound band in the tube out of contact with the tube, said supporting members being engaged with the sides of the wound band, and means for retaining said supporting members in supporting position and in engagement with the sides of the wound band and including caps adapted to close the ends of the tube, said caps being fast on the tube to prevent displacement thereof from the tube and to prevent leakage thereby.

9. In a container for packaging a duplicating machine or similar band that is wound on a spindle having the ends thereof extended beyond the sides of the wound band, the combination of a tube adapted to receive the wound band and the spindle, supporting members mounted in said tube and having openings therein to receive the extended ends of the spindle to support said wound band in the tube out of contact with the tube, said supporting members being engaged with the sides of the wound band, and means for retaining said supporting members in supporting position and in engagement with the sides of the wound band and including caps adapted to close the ends of the tube, said caps having medially located outwardly rounded portions and being fast on the tube to prevent displacement thereof from the tube, the rounded portions on said caps preventing said container from being stood on end to thereby insure support of said band in the container and on the spindle on which it is wound.

10. In a container for packaging a duplicating machine or other similar band that is wound on a spindle having the ends thereof extended beyond the sides of the wound band, and means detachably connecting the end of the band to the spindle, the combination of a tube adapted to receive the wound band and the spindle, supporting members mounted in the tube and having openings therein to receive the extended ends of the spindle to support said wound band in the tube out of contact with the tube, said supporting members being engaged with the sides of the wound band, and means for retaining said supporting members in supporting position and in engagement with the sides of the wound band and including caps removably mounted at the ends of the tube whereby one of said caps may be removed to permit removal of the wound band from the container whereby said wound band may be removed from the spindle on which it is wound, the detachable connection of said band to said spindle being revealed to permit disconnection of the band from the spindle when all of the band has been unwound from said spindle.

11. In a container for packaging a duplicating machine or similar band that is wound on a spindle having a flattened portion thereon adapted to receive overlapped parts of the band whereby said band may be wound into a truly round package, said spindle having the ends thereof extended beyond the sides of the wound band, the combination of a tube adapted to receive the wound band and the spindle, supporting members mounted in said tube and having

openings therein to receive the extended ends of the spindle to support said wound band in the tube out of contact with the tube, said supporting members being engaged with the sides of the wound band, and means for retaining said supporting members in supporting position and in engagement with the sides of the wound band whereby said spindle is carried in the container on said supporting members, said flattened portion on the periphery preventing damage to the band while it is supported on said spindle in the container by avoiding bulging of the band.

12. A spindle adapted to have a gelatin band wound thereon and having a slot therein, said spindle having a notch in one wall of said slot and adapted to receive a device mounted in a rigid member fast on the band at one end thereof whereby when said rigid member is mounted in said slot and said device is engaged in said notch said band is connected to said spindle in a predetermined position therealong.

13. A spindle adapted to have a gelatin band wound thereon and having a slot extending thereinto intermediate the ends thereof, said spindle having a flattened portion thereon adjacent said slot and adapted to receive an overlapped portion of the band when the end of the band is disposed in said slot whereby said band may be smoothly wound on said spindle, the overlapped portion of said band including a rigid member adapted to be disposed in said slot to insure accurate connection of the band to the spindle.

14. A spindle adapted to have a gelatin band wound thereon and having a slot extending thereinto intermediate the ends thereof, said spindle having a notch in a wall of said slot, said spindle having a flattened portion providing a land merging into the wall of said slot opposite that having the slot therein whereby a hemmed portion of the band having a rigid member therein and an overlapped portion and a locating device may be accurately connected to the spindle with the rigid portion disposed in said slot and the locating device in said notch and the overlapped portion lying on said land.

15. A spindle adapted to have a gelatin band or the like wound thereon and having a slot therein, said spindle having a notch in one wall of said slot and adapted to receive a device on the band to thereby connect the band to the spindle in a predetermined relation.

16. A spindle adapted to have a gelatin band or the like wound thereon and having a slot therein intermediate the ends thereof, said spindle having a notch in one wall of said slot midway between the ends of said slot and adapted to receive a device on the band to thereby connect the band to the spindle in a predetermined relation.

17. A spindle adapted to have a gelatin band or the like wound thereon and having a slot therein and a notch in one wall of said slot located midway between the ends of the spindle, said slot extending equidistantly on each side of said notch, said notch being adapted to receive a medially located device on the band to thereby center the band on the spindle when the end of the band is disposed in said slot.

18. A spindle adapted to have a gelatin band or the like wound thereon and having a slot extending thereinto intermediate the ends thereof, said spindle having a flattened portion thereon adjacent said slot and adapted to receive an overlapping portion of the band when the end

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of said band is disposed in said slot whereby said band may be smoothly wound on said spindle.

19. A spindle adapted to have a gelatin band or the like wound thereon and having a slot extending thereinto, said spindle having the periphery thereof adjacent one wall of said slot flattened to provide a land whereby the free marginal end of the band inwardly of a hem at the end thereof may be disposed on said land when said hem is disposed in said slot to permit said band to be smoothly wound on said spindle.

20. A spindle adapted to have a gelatin band or the like wound thereon and having a slot extending thereinto, said spindle having a notch in one wall of said slot adapted to receive a device secured at a hem at the end of said band when said hem is disposed in said slot, said spindle having the periphery thereof flattened adjacent one wall of said slot to provide a land adapted to receive the free marginal end of said band whereby said band may be smoothly wound on said spindle.

JOHN J. FLANIGAN.

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25	100
30	105
35	110
40	115
45	120
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70	145
75	150