

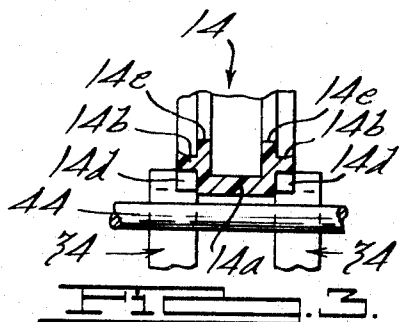
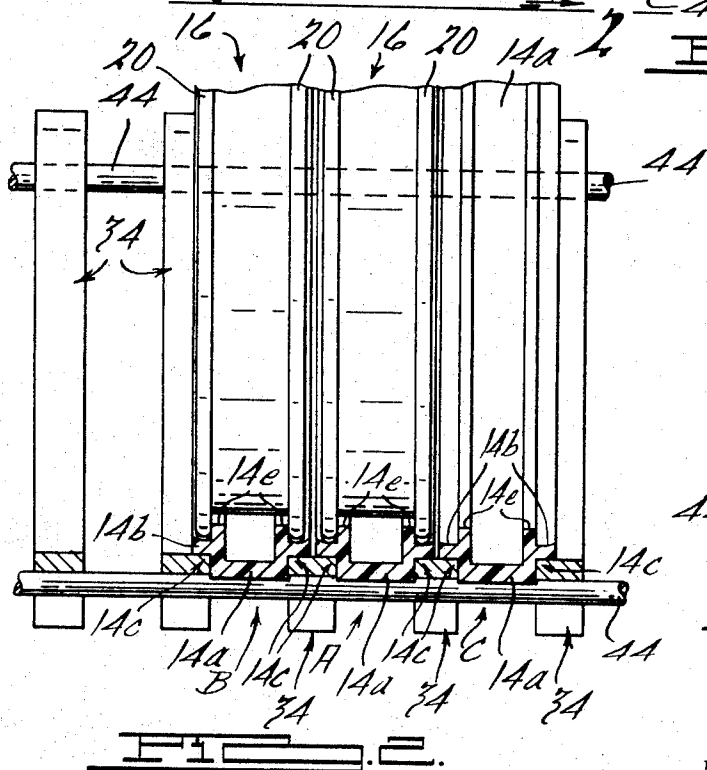
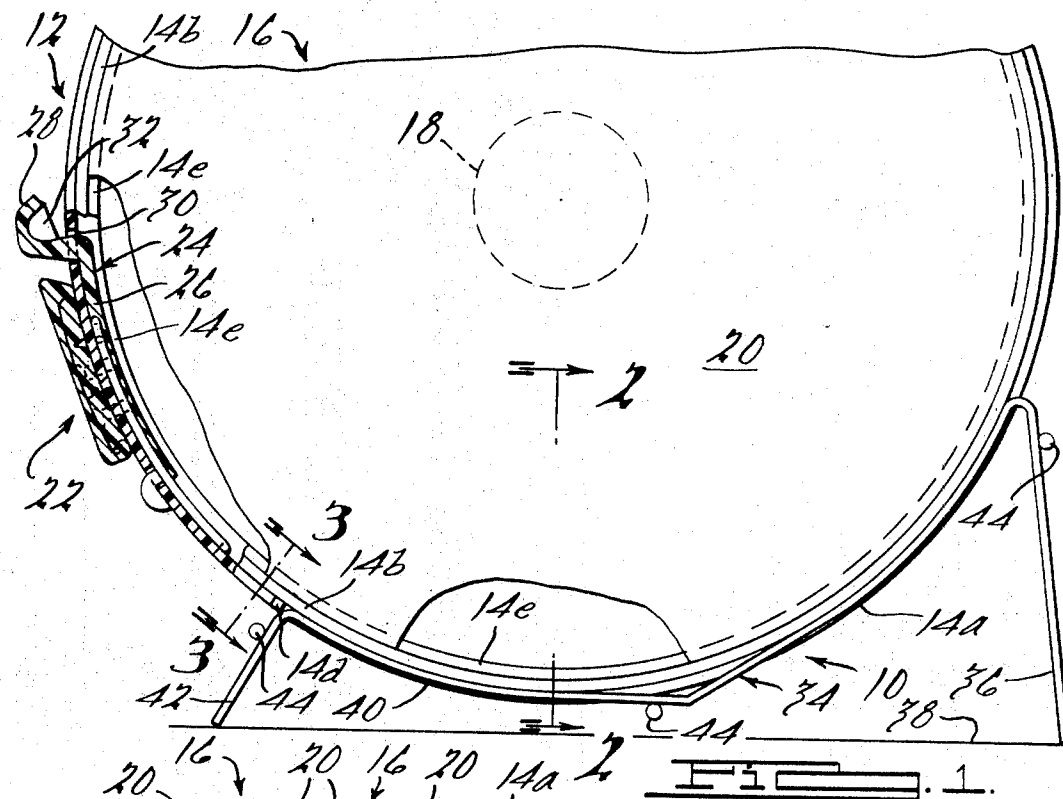
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REEL STORAGE APPARATUS

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REEL STORAGE APPARATUS

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9 Claims

ABSTRACT OF THE DISCLOSURE

A reel storage apparatus wherein each reel is sealed by an encircling sealing ring and the sealing rings, together with their encircled reels, are stored in side by side relation on a storage rack comprising a plurality of spaced wires arranged in laterally spaced relation and bent into a generally arcuate upwardly opening configuration to individually receive arcuate channels defined on the outer periphery of the sealing rings.

Background of the invention

This invention relates to reel storage apparatus. More particularly, it relates to a novel sealing ring of the type adapted to sealingly encircle a reel, and to a novel storage rack adapted for use with the sealing ring of the invention. Various forms of sealing rings are available, as well as various forms of storage racks to receive these sealing rings with their encircled reels. While these rings and racks, in combination, are generally satisfactory, they do have certain disadvantages. Specifically, they tend to be rather complicated, and therefore expensive, in construction, and they do not afford maximum utilization of available space.

Summary of the invention

It is an object of the present invention to provide improved reel storage apparatus.

A more particular object is to provide a reel storage apparatus which is simple and inexpensive in construction and which affords maximum utilization of the available storage space.

In the reel storage apparatus of the invention, each sealing ring comprises a strip of flexible material adapted to be formed into a loop to encircle a reel and defining at its outer periphery a radially outwardly opening arcuate channel, and the storage rack defines a plurality of upwardly opening concave support surfaces disposed in side by side, laterally spaced relation to receive a plurality of reels with the arcuate channels in the flexible strips encircling the reels receiving the support surfaces to provide bottom, side by side storage support for the reels.

According to a further feature of the invention, two channels are provided in each strip, one along each axial edge of the strip, and each channel opens at its axially outer side as well as radially; and each support surface has a width approximately twice the width of each channel so that each support surface is received within the left hand channel of one strip and the right hand channel of an adjacent strip to support the adjacent reels in close, side by side relation.

These and other objects and features of the invention will be apparent from the detailed description to follow.

Brief description of the drawings

A preferred embodiment of the invention is illustrated in the accompanying drawing. In the drawing:

FIG. 1 is a fragmentary side elevational view of a reel storage apparatus according to the invention; and

FIGS. 2 and 3 are fragmentary cross sectional views taken on lines 2—2 and 3—3, respectively, of FIG. 1.

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Detailed description of the preferred embodiment

The reel storage apparatus of the invention includes a storage rack 10 adapted for coaction with one or more sealing rings 12.

Each sealing ring 12 includes a strip 14 of flexible material such, for example, as polyurethane, formed into a loop to encircle a reel 16. Reel 16 is of the type including a central spool 18 and generally circular flanges 20 at opposite ends of the spool concentric with the spool axis.

Strip 14 may be either extruded or molded. In cross section, as seen in FIGS. 2 and 3, it includes a generally U-shaped main body portion 14a and a pair of rib portions 14b projecting axially outwardly from the opposite legs of main body portion 14a. The radially outer annular surface of each rib 14b cooperates with the adjacent axially outer annular surface of main body portion 14a to define an arcuate circumferential channel 14c along each axial edge of the strip.

Channels 14c extend continuously around the outer periphery of strip 14 but are each interrupted by a land or stop portion 14d forming a block in the channel. If strip 14 is formed in a molding operation, land portions 14d may be molded integral with the remainder of the strip. If strip 14 is formed in an extrusion operation, land portions 14d may be formed by separate elements suitably secured to the extruded plastic strip. The radially inner portions of the legs of U-shaped main body portion 14a define rib portions 14e which are adapted to fit within the outer peripheral edges of reel flanges 20 to determine the axial positioning of the strip loop on the reel.

The sealing ring is releasably maintained in sealing position around the reel by latch means 22, including coacting latch elements on the free ends of the strip loop. Any suitable form of latch means may be employed. A preferred form of latch means is shown in FIG. 1; the illustrated latch means is described in detail in applicant's copending patent application Ser. No. 601,205, filed Dec. 12, 1966.

As described in that application, latch means 22, in addition to the coacting latch elements on the free ends of the strip loop, also includes a guide member 24. Member 24 includes an arcuate block portion 26 fitted within the channel of the U-shaped main body portion 14a of the strip, and a handling portion 28 extending radially outwardly through an aperture 30 in main body portion 14a. In the copending application, handling portion 28 is in the form of a hook to facilitate hanging of the sealing ring and encircled reel from a suitable overhead support. In the embodiment of the present application, the hook opening is filled by a web 32 to provide a convenient handle for grasping the sealing ring. Latch means 22 is identical in all other respects to the latch means of the copending application.

Storage rack 10 comprises a plurality of wires 34 of flat wire stock. Each wire 34 includes a relatively long rear leg portion 36 extending upwardly from a suitable base surface 38, a central portion 40, and a relatively short forward leg portion 42 extending downwardly for engagement with support surface 38.

Central portion 40 is bent into a concave, upwardly opening arcuate configuration so that the upper surface of central portion 40 defines a concave, upwardly opening support surface lying generally on a circular arc having a radius generally equal to that of the reels 16 to be stored.

Wires 34 are rigidly secured to each other by a series of round stock wires 44. Wires 44 are spot welded to wires 34 and establish and maintain an axial distance between adjacent wires 34 slightly greater than the exterior axial width of U-shaped main body portion 14a of

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strips 14. The axial width of wires 34 is equal to approximately twice the axial width of channels 14c.

In use, a sealing ring 12 is positioned around a reel to be stored with rib portions 14e fitting within reel flanges 20, whereafter latch means 22 is manipulated to releasably maintain the sealing ring in its encircling condition. The sealing ring and encircled reel are then placed on the storage rack with the left hand channel 14c receiving and resting on one wire 34, the right hand channel 14c receiving and resting on an adjacent wire 34, and the radially outer portion of U-shaped main body portion 14a positioned between the adjacent wires. Left hand channel 14c overlies approximately one half of the related wire 34 while right hand channel 14c overlies approximately one half of the adjacent wire 34.

Unit A of FIG. 2 depicts a sealing ring and reel assembly positioned on rack 10 as above described. Another sealing ring and reel assembly B is seen positioned beside unit A. The right hand channel 14c of the sealing ring of assembly B receives the remaining one half of the wire 34 received within the left hand channel 14c of the sealing ring of assembly A so that the right hand peripheral edge of the sealing ring of assembly B is closely juxtaposed to the left hand peripheral edge of the sealing ring of assembly A, thereby achieving compact, side by side storage of the reel units with maximum utilization of available space. Unit C in FIG. 2 comprises simply a sealing ring, with the reel omitted to show some of the details of the sealing ring construction.

When positioning a ring and reel assembly on the rack, the assembly is positioned between two adjacent wires 34 as previously described whereafter the unit is rotated on the rack about the reel and rack axis until stop portions 14d are brought into engagement with the knees formed by the juncture of the forward and central portions of the supporting wires 34, stop 14d thus functioning to index the assembly and bring handle 28 into alignment with the handles on adjacent assemblies.

When it is desired to remove a reel and ring assembly, handle 28 is grasped and pulled generally downwardly; this causes the assembly to pivot forwardly about a fulcrum defined by stops 14d to a position displaced from the other assemblies, in which position it may be readily grasped and removed from the rack.

The disclosed reel storage apparatus will be seen to provide a simple inexpensive construction offering maximum utilization of available storage space.

While a preferred embodiment of the invention has been illustrated and described in detail, it will be understood that various changes may be made in the preferred embodiment without departing from the scope or spirit of the invention as defined by the appended claims.

I claim:

1. A storage apparatus for reels of the type including a central spool and generally circular flanges at opposite ends of said spool concentric with the spool axis, said apparatus comprising:

(A) a plurality of sealing rings each including:

- (1) a strip of flexible material adapted to be formed into a loop to encircle a reel and defining at its outer periphery a radially outwardly opening arcuate channel and a main body land portion adjacent said channel, and
- (2) coacting latch means on the free ends of the strip to releasably maintain the strip in encircling relation around the reel; and

(B) a storage rack including a plurality of support portions defining at their respective upper faces a plurality of upwardly opening, concave support surfaces disposed in side by side relation and defining lateral spaces therebetween of a width to pass said land portions of said strips to allow said support portions to seat within the arcuate channels of said strips with said support surfaces embracing the bot-

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toms of said arcuate channels to provide bottom, side by side storage support for said reels.

2. A storage apparatus according to claim 1 wherein: (C) two radially outwardly opening arcuate channels are provided at the outer periphery of each strip with a main body land portion defined therebetween; and

(D) a support portion as aforescribed is seated in each said channel with said main body land portion of each strip passing between the two support portions seated in the channels of that strip.

3. A storage apparatus according to claim 2 wherein: (E) there are two said channels in each strip, one along each axial edge of the strip and each channel opens at its axially outer side as well as radially; and

(F) each support surface has an axial width twice the axial width of each of said channels and said support surfaces are spaced apart a distance slightly greater than the distance between the two arcuate channels on a strip, whereby the sealing strips with their encircled reels may be supported on said storage rack with each support surface received within the left hand channel of one strip and the right hand channel of an adjacent strip and the axial edges of adjacent strips in juxtaposed relation.

4. A storage apparatus according to claim 3 wherein: (G) said storage rack comprises a plurality of separate wire members arranged in laterally spaced relation and bent into a generally arcuate upwardly opening configuration to define said support surfaces at their upper surfaces.

5. A storage apparatus according to claim 4 wherein: (H) each wire member includes:

- (1) a relatively long rearward portion extending upwardly from a base surface,
- (2) a central portion defining the aforesaid upwardly opening arcuate configuration, and
- (3) a relatively short forward portion extending downwardly to said base surface.

6. A storage apparatus according to claim 5 wherein: (I) each channel of each strip is interrupted by a land portion which is adapted to engage the knee formed by the juncture of the forward and central portions of the wire members to index the strip and enclosed reel with respect to the storage rack and with respect to the other reels and to provide a fulcrum about which the strip and reel may be rotated to facilitate removal from the rack.

7. A storage apparatus according to claim 6 wherein: (J) each sealing ring further includes a handle member projecting outwardly from the outer periphery of the related strip to facilitate grasping of the ring and enclosed reel.

8. A tape storage apparatus comprising:

(A) a tape storage reel including a central spool and generally circular flanges at opposite ends of the spool concentric with the spool axis;

(B) a sealing ring comprising a strip of flexible material adapted to be formed into a loop to encircle said reel and defining a channel at its outer periphery along each of its axial edges with each channel in the looped configuration of said strip opening at its axially outer side as well as radially outwardly; and

(C) coacting latch means on the free ends of said strip to releasably maintain said strip in encircling relation around said reel.

9. A tape storage apparatus according to claim 8 wherein said strip includes:

(D) a main body portion having a generally U-shaped cross section opening toward the center of the loop; and

(E) a pair of annular rib portions projecting axially outwardly from the axially outer surfaces of the opposite legs of said main body portion at a location

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intermediate the radial height of said outer surfaces,
the radially outer annular surface of each said rib
thus coating with the radially outer portion of the
aforesaid outer surface of the adjacent leg of said
main body portion to define said axially and radially
opening channels and the radially inner annular sur-
face of each said rib thus coating with the radially
inner portion of the aforesaid outer surface of the
adjacent leg of said main body portion to engage
the peripheral edges and the axially inner faces, re-
spectively, of said circular flanges.

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U.S. Cl. X.R.

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