Dec. 25, 1962 J. G. FELDKAMP 3,070,001

BINDER STRAP GUIDE TRACK

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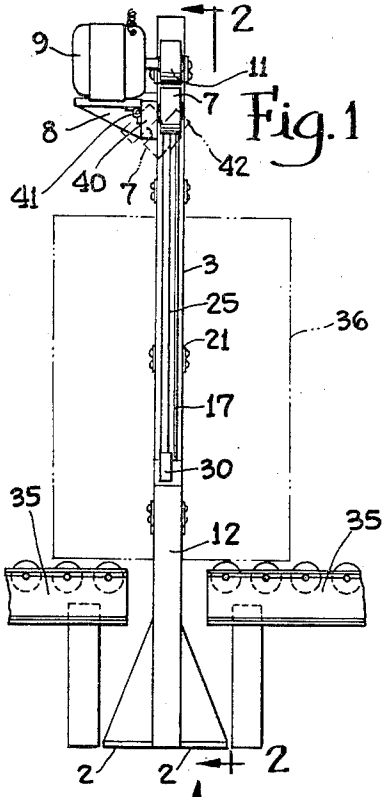


Fig. 1

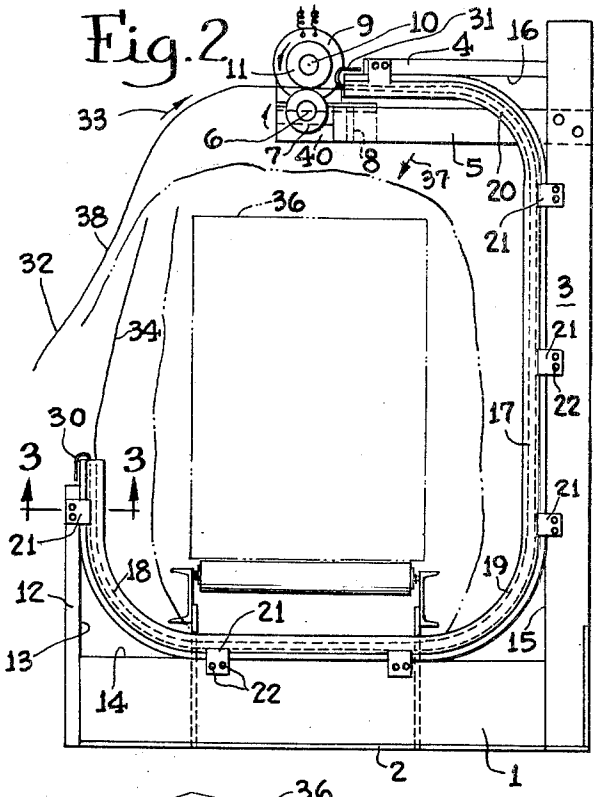


Fig. 2

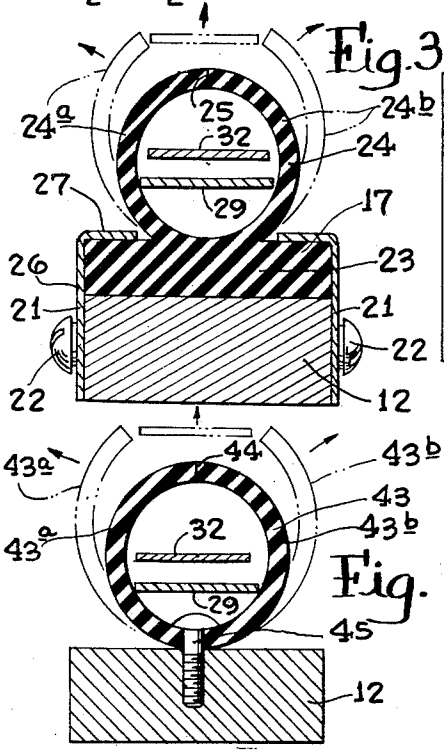


Fig. 3

Fig. 3a

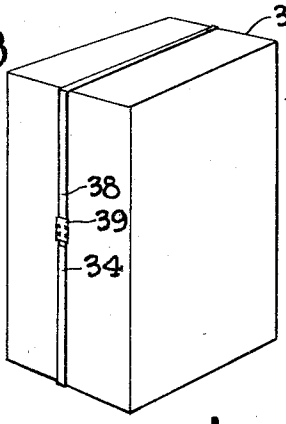


Fig. 5

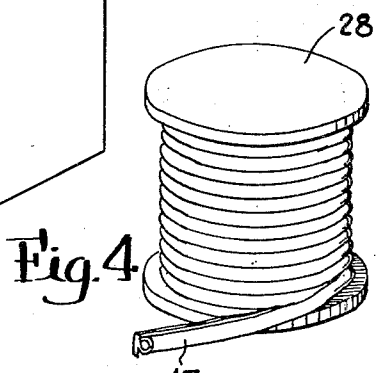


Fig. 4

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BINDER STRAP GUIDE TRACK

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This invention relates to improvements in binder strap guide tracks and particularly to a type which releasably retains the binder strap in a fixed path as it is guided about an object to be bound with the binder strap.

Presently, it is quite common to provide binder strap guide tracks in the form of closed or partially closed loop tracks for guiding a binder strap about an object to be bound. These are adaptable for and have been adapted to both automatic and semi-automatic strapping machines employing power means to feed the binder strap through and around the track, and also to hand strapping apparatus where the binder strap is fed by hand into the strap guide track means. Oftentimes the tracks used are of channel shape without any retaining means for the binder strap. In such a case the tracks are small enough that the force resulting from the natural springiness of the looped binder strap or the weight of the strap or both keeps the binder strap pressing outwardly against the strap track as the binder strap is fed through it and conformed to the looped track shape. In other cases, releasable means in the form of spring like or spring loaded clips or spring loaded side guides are provided in the track for retaining the binder strap. Releasable means of this sort is required especially when the guide is of fairly large size and length. One of the disadvantages of the conventional releasable means for a strap guide track is that it is usually relatively expensive to manufacture and oftentimes is limited in use because of its tendency to sometimes snag and kink the binder strap, especially when the binder strap is of light gauge.

It is the principal object of this invention to provide an improved binder strap guide track which is of extremely simple construction, inexpensive to manufacture, versatile in use, and which works efficiently without injury to even the lighter gauge binder straps.

The invention can be better understood by referring to the accompanying drawings in which.

FIG. 1 shows a front elevation of the major portions of a strapping machine embodying the binder strap guide track of this invention;

FIG. 2 shows a right side elevation of the machine of FIG. 1 as viewed along the line 2—2 of FIG. 1;

FIG. 3 shows a sectional view of the binder strap guide track as viewed along the line 3—3 of FIG. 2;

FIG. 3*a* shows a sectional view of a modified binder strap guide track as it would appear viewed along the line 3—3 of FIG. 2;

FIG. 4 shows a wound spool of the binder strap guide track material used in the embodiment of FIGS. 1 and 2; and

FIG. 5 shows a container as it would appear after being bound with a binder strap while using the apparatus of FIGS. 1 and 2.

A preferred embodiment of the invention, as shown in FIGS. 1 and 2, comprises a base member 1 provided with lateral flanges 2. The base member 1 is used to support the entire unit. Attached to the rear of the base member 1 is a vertical upright support 3 which provides an L-shape with the base member 1. Secured adjacent the upper end of the upright support 3 are two horizontally extending arms 4 and 5 which extend toward the front of the unit. Arm 4 is a strap guide track support, as will be described, and arm 5 is provided with a laterally extending shaft 6 which rotatably supports an idler

feed wheel 7 and this arm 5 also supports a bracket 8 on which is mounted an electric motor 9. The shaft 10 of the motor 9 supports a feed wheel 11 which is keyed to the shaft 10 and driven thereby as the shaft rotates when the motor 9 is electrically energized. The forward end of the base member 1 is provided with an upright member 12 fastened to it.

Positioned to contact the inner surfaces, 13 of member 12, 14 of member 1, 15 of member 3, and 16 of member 4, is a continuous length of flexible track 17 which is bent with a curvilinear shape in three corner portions 18, 19 and 20 to provide a modified C-shape as shown in FIG. 2. While in this shape, the track 17 is retained in position by means of a plurality of clips 21 which are fastened to the members 12, 1, 3 and 4 by means of screws 22.

Details of the shape of the clips 21 in relation to the track 17 is shown specifically in FIG. 3. The track 17, is one embodiment, consists of a cross sectional shape comprising a rectangular portion 23 which is connected at its mid-portion to a hollow circular tubular portion 24. The rectangular portion 23 may be integral with the tubular portion 24 and may be formed by casting or extrusion in a single piece. The tubular portion 24 is split at 25 along its entire length to divide the tubular portion 24 into two halves 24*a* and 24*b*. The rectangular portion 23 extends for the width of the upright member 12 against which it is positioned and the clips 21 are of L-shape consisting of a longer portion 26 connected to a shorter flange 27. The flange 27 is connected over the ends of the rectangular portions 23 of the track 17 to hold the track 17 positioned against the upright member 12. The screws 22 hold the clips securely fastened in place. Although only the connection to the member 12 is shown in cross section, the connection of the clips 21 to the other members 1, 3 and 4 is substantially the same.

The material from which the track 17 is manufactured can be of many different types of flexible plastic or of rubber or other equivalent materials. It may be sufficiently flexible that it can be provided in a coil as shown in FIG. 4 where it is wound on a spool 28. This makes it very convenient for manufacture of a strap track because a desired length of track can be cut as needed from the compact spool.

In addition to the track 17, a flat metal ribbon 29 is passed through the entire length of track 17 and the ends 30 and 31 of the ribbon 29 are bent over the ends of the track 17, as shown in FIG. 2, in order to keep the ribbon 29 retained in a relatively fixed position within the track 17.

In operation, a supply of strap 32 is drawn off from a supply of strap which may be in the form of a coil (not shown) mounted on a conventional type coil support or unreeler (not shown). The strap 32 is fed in the direction of the arrow 33 and may be fed either by hand or by means of the feed wheels 7 and 11 driven by the electric motor 9. The strap is fed into the upper end of the track 17, entirely through it, and out of the lower end so that its leading end 34 extends upwardly from the lower end of the track 17. Conventional roller type support members 35 are provided on either side of the unit, as shown in FIG. 1, and these are provided to support a container 36 or other object to be bound in a position as shown in FIGS. 1 and 2. With the container 36 in position, the strap 32 which is in the form of a loop encircled about the container 36 is contracted onto the container by pulling the strap in the direction of the arrow 37 until it fits relatively snugly on it. When pulling the strap 32 to contract it, it is pulled out of the tubular portion 24 of the track 17 by the strap itself pressing against the two halves 24*a* and 24*b* which are flexible enough to be spread apart as shown in phantom

lines in FIG. 3. As they spread apart sufficiently, a progressive opening is provided through which the strap 32 progressively leaves the track 17. After the strap leaves the track and is contracted onto the container 36, the two halves 24*a* and 24*b* are sufficiently resilient to return together and narrow the slit or split 25. At this time the leading end 34 of the strap and its supply end 38 are in overlapping relation with each other so that a conventional strapping tool or tools can be used to tension the binder strap 32 tightly on the container 36 and then secure the ends together by providing an interlocking type joint between them and a tubular metal seal 39, as shown in FIG. 5. It is not deemed necessary to show such a tool or tools because they are well known in the art and many different varieties are available for use in this manner.

In order to facilitate removal of the strap from between the feed wheels 7 and 11 when contracting the strap loop onto the object being bound, it is desirable that the feed wheel 7 be mounted on a shaft which is connected to a block 40 which is pivoted on a spring loaded hinge 41 to the arm 5. The force of the spring and spring loaded hinge 41 is such that it causes the feed wheel 7 to ordinarily press against the feed wheel 11. But, when the strap is pulled downwardly, the block 40 and the feed wheel 7 are free to pivot downwardly to a position as shown in phantom lines at 42 in FIG. 1. In that position, the strap is free to fall out from between the feed wheels.

The purpose of the metal ribbon 29 running through the strap track 17 is to provide a hard and smooth surfaced backing to minimize friction and thereby facilitate the feeding of the strap into the track 17.

A modified form of the strap track is shown in FIG. 3*a*. It consists of a circular tubular portion 43 which is divided into two halves 43*a* and 43*b* because it is split at 44 along its entire length similar to the split 25 of the track shown in FIG. 3. With the use of this form of track 43, the clips 21 are not required. Screws 45 are provided directly through the track to fasten the track to the members 12, 1, 3 and 4. Similarly, the metal ribbons 29, used as a low friction backing surface for the binder strap, is also provided in the same manner as for the track 17. In operation, this track acts identically to the one shown in FIG. 3 whereby, when the strap 32 is withdrawn from the track, the two halves 43*a* and 43*b* deflect outwardly as shown in phantom lines in FIG. 3*a*.

Although the invention is shown without any power equipment except as indicated by the strap feed means

associated with the feed wheels 7 and 11, this type of binder strap guide track can be embodied in many different types of hand operated, semi-automatic, or automatic machines wherein a binder strap guide track is required. It should be further understood that the invention also can be manufactured in other different ways without departing from the true scope of the invention as defined by the appended claim.

I claim:

Apparatus for encircling a binder strap about an object to be bound including a binder strap receiving and guiding track extending in a path about the location where the object to be bound is positioned, said track comprising, a single longitudinally continuous strip of flexible and resilient rubber-like material which allows the strip to be withdrawn from a coil of said strip, and readily bent longitudinally into any of a plurality of track shapes, said strip having two longitudinally continuous side walls integrally formed as part of said strip of said rubber-like material so that the side walls are likewise flexible and resilient to permit their yielding and returning to shape when deformed by force of a binder strap moving between the side walls or by externally applied force, said side walls being joined longitudinally to a central base portion of said strip where the base is provided with means for connecting the strip to a separate support frame, said side walls being spaced from each other and convergent in a direction away from said base to provide the inside surfaces of the side walls with gradual slopes extending from said base to the free edges of the side walls, said free edges being divided from each other by a slit positioned in central longitudinal alignment with the longitudinal direction of said base of said strip, said gradual slopes of the inside surfaces of the side walls allowing a binder strap positioned between the side walls to be withdrawn out through said slit by a camming of the strip against the side walls with a minimum of effort because of said gradual slopes of said inside surfaces of the side walls.

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