Sept. 10, 1940. A. E. ADAMSON 2,214,315

REEL

Filed Jan. 11, 1937 2 Sheets-Sheet 1

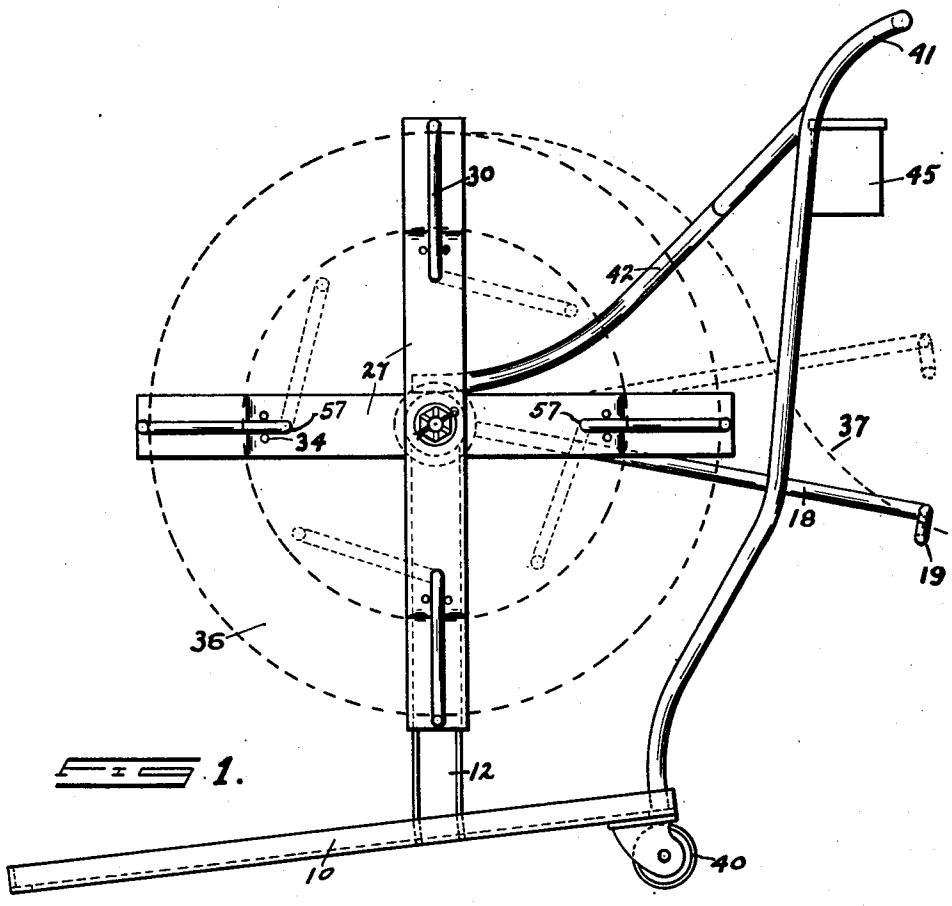


Fig. 1.

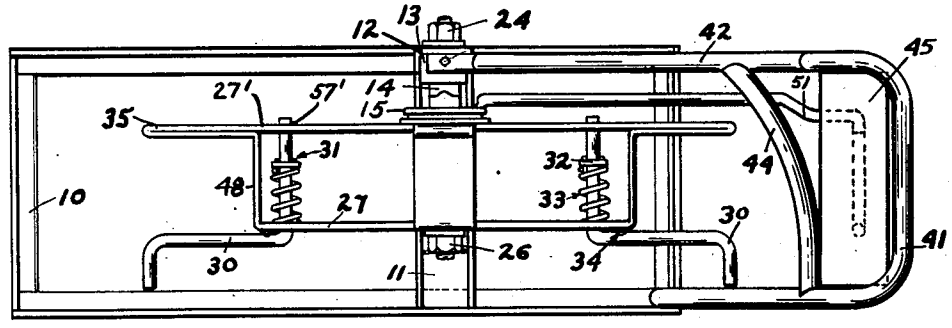


Fig. 2.

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FIG 3.

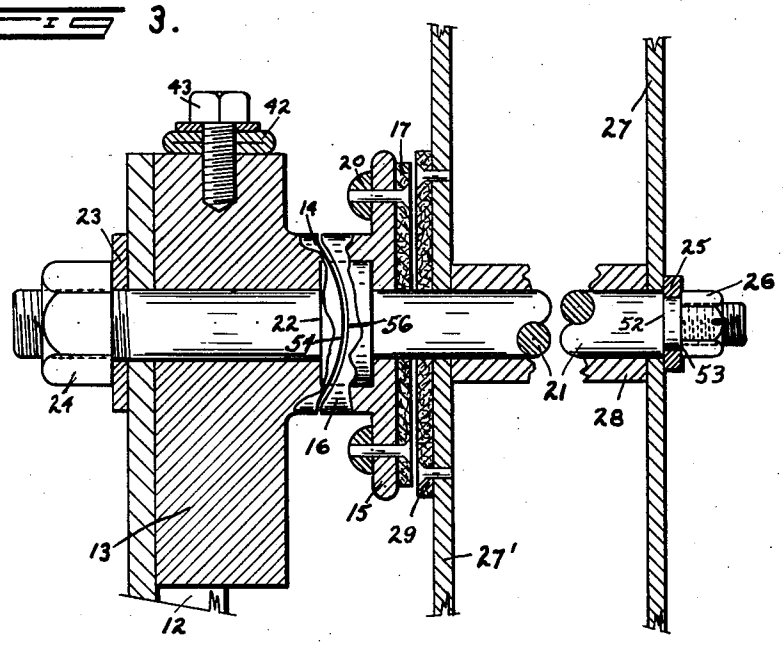
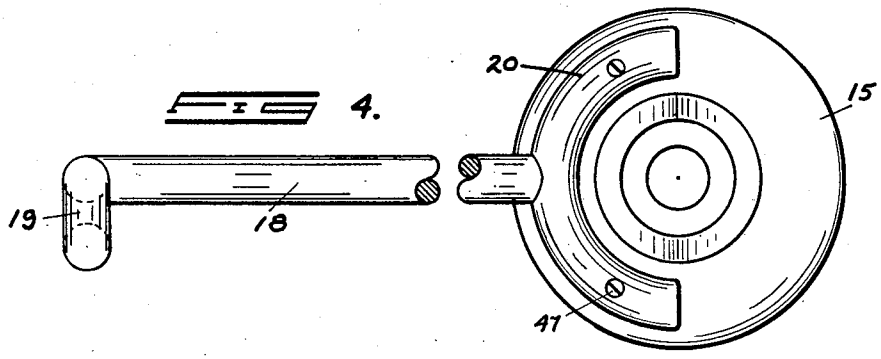


FIG 4.



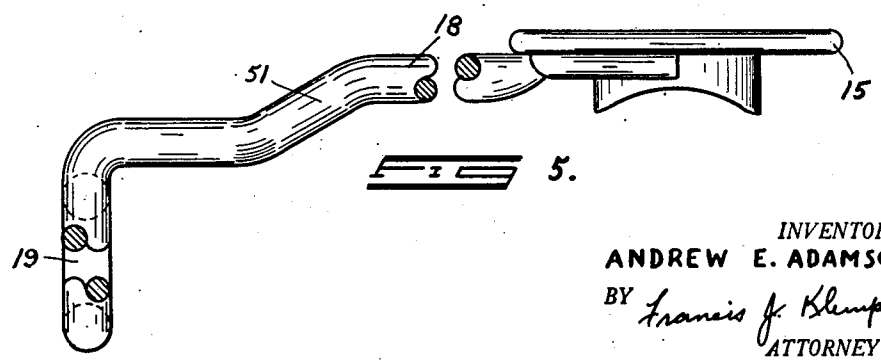


FIG 5.

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UNITED STATES PATENT OFFICE

2,214,315

REEL

Andrew E. Adamson, Warren, Ohio, assignor, by mesne assignments, to The Mahoning National Bank of Youngstown, Youngstown, Ohio, a national banking association, as trustee

Application January 11, 1937, Serial No. 120,070

7 Claims. (Cl. 242—105)

This invention relates to a reel and more particularly to a reel for rotatably supporting coils of steel strapping or wire and for dispensing such strapping or wire when used in connection with binding operations on cartons, crates, boxes and the like. The invention is particularly useful in connection with such binding operations since apparatus embodying my improvements requires a minimum of time and attention on the part of the operator.

Binding material is furnished the consumer usually in coil form. The practice is to place the coil on a rotatable support commonly termed a reel whereby the material may be taken from the periphery of the coil simply by pulling the free end of the material. Some means must be provided to hold the coil in position on the reel and in all prior devices of which I am aware it is necessary to either remove the reel entirely from its support or to partially dismantle the reel when a coil is taken off or placed on the same. Also some means must be provided to prevent the free spinning of the reel after the necessary amount of material has been removed from the coil and in the prior devices this has been taken care of by providing a constantly applied brake to the reel. This is objectionable in that the effort involved in rotating the reel is thereby increased.

I overcome the objections of the prior devices by providing an improved means to hold the coil on the reel and by providing an automatically operable brake to control the rotation of the reel.

Accordingly, an object of this invention is to provide a reel having simple rotatable means to hold the coil on the reel and to serve as a guide for the side edge of the coil.

Another object of my invention is to provide a brake to control the rotation of the reel operable by simply manipulating the free end of the material being dispensed.

A further object of the invention is to provide a portable dispensing reel which is economical to manufacture but which is rugged and trouble free in use and attractive in appearance. The elements are so arranged that a minimum of time is required for the mounting of a new coil of material and that the device is operable without further attention so long as a portion of the coil remains.

These and other objects and advantages of the inventtion will become apparent from a consideration of the drawings and the following detailed description.

In the drawings:

Figure 1 is a side elevation of a reel constructed in accordance with my invention;

Figure 2 is a plan view of the reel of Figure 1;

Figure 3 is an enlarged sectional view of the reel supporting assembly showing the braking means in detail;

Figure 4 is a side view of the brake disk with its operating arm; and

Figure 5 is a plan view of the brake disk and arm.

Referring particularly to Figures 1 and 2, the reel support consists of a rectangular frame 10 built up of a plurality of pieces of angle sections welded or otherwise suitably secured together. A transversely extending channel member 11 is secured between the side rails of the frame 10 and has a vertically extending channel member 12 secured to one end thereof. If desired, the channel member 12 may be positioned at right angles to the plane of the rectangular frame 10 so as to throw the weight of the coil and reel further to the left end of the frame, as viewed in Figure 1, when that end of the frame is lowered to engage the floor. The channel 12 is the sole support for the rotating reel thereby leaving one side of the reel entirely free from any obstructions.

Fitting within the channel 12 at the upper end thereof is the block 13 which is held rigidly in position by the spindle bolt 21 and nut 24. For this purpose the bore through the block 13 is enlarged for a portion of its extent, as shown, thus providing an internal shoulder which is engaged by the shoulder 22 of the integral enlarged portion of the spindle bolt 21. If desired a locking washer 23 may be placed under the nut 24. It is readily apparent that the shoulder 22 of the spindle bolt 21 and the nut 24 are operative to securely clamp the block 13 to the channel member 12 while leaving the outer end of the spindle bolt 21 entirely free. The block 13 is provided with a laterally extending projection 14, the outer surface of which is provided with a cam surface 54 for a purpose to be later described.

Rotatably mounted on the spindle bolt 21 is the disk 15 which is provided with a laterally extending tubular projection 16 having an outer cam surface 56 and complementary to the cam of the projection 14. The laterally extending tubular projection 16 is provided with an enlarged bore to rotatably fit about a portion of the integral enlarged portion of the spindle bolt. The outer surface of the disk 15 has rigidly secured thereto a disk 17 of any suitable brake lining while on its inner surface is secured the fork 20 of an operating arm 18 having a looped end 19. As shown

more clearly in Figure 2, operating arm 18 is provided with an offset 51 adjacent its free end so that the free end of the arm is approximately in the plane of the radial projections 35 of the reel. This feature is of advantage in that the offset forms a guide for the strip material issuing from the reel. While I have shown the fork 20 secured to disk 15 by means of machine screws 47, it is obvious that other means, as welding, for example, may be employed for the same purpose.

The reel proper is built up of the short and long spokes 27 and 27', respectively, to provide a wheel-like structure for the support of the coil 36. The bars forming these spokes are bent so as to provide a plurality of supporting surfaces 48 which extend in a direction parallel with the axis of rotation of the reel. At the ends of the surfaces 48 adjacent the supporting channel 12, radially extending projections 35 are provided by the longer spokes 27' thus forming means at that end of the reel to hold the coil in place. To provide means at the front end of the reel to hold the coil in place I provide the crank-shaped members 30, one portion of which extends through aligned openings 57 and 57' in the spokes 27 and 27', respectively. A pin 31 extends through each member 30 between the bars for forming a bearing for the washer 32 which in turn receives the thrust of the coil spring 33 positioned between washer and the spoke 27. The function of the spring 33 is to keep an inward pressure to the crank members 30 thereby holding the coil 36 in proper position on the reel when the members 30 are in operative position. As shown in Figure 1, the members 30 are rotatable so that the radially extending portions thereof may be swung to a position wholly confined within the periphery of the supporting surfaces 48. Spaced headed rivets 34 secured to the bars 27 are operative to hold the swinging arms 30 in operative position, the springs 33 insuring the holding of the arms 30 between the heads of the adjacent pairs of rivets.

As shown more clearly in Figure 3, aligned apertures are provided in the central portion of the bars forming spokes 27 and 27' for the accommodation of the spindle 21. To lend stability and rigidness to the reel, a sleeve 28 is positioned between the bars about the apertures and is welded to the bars. On the rear face of the reel, a fibre disk 29 is secured for cooperation with the brake lining 17 of the disk 15. The reel assembly is rotatably supported on the free end of the spindle 21 and is held in position thereon by the castellated nut 26 screwed onto the end of the spindle. A washer 25 may be positioned beneath the nut to reduce friction between the reel and the nut. The free end of the spindle is provided with the shoulders 52 and 53 against which the washer 25 and nut 26 are positioned so that the reel is always free to rotate regardless of the tightness of the nut 26.

The frame 10 is provided with a handle 41 consisting of an inverted U-shaped tube having its lower ends welded or otherwise suitably secured in the corners of the frame. A brace member 42 having one end fastened to the handle near the top thereof and the other end flattened and secured to block 13 by cap screw 43 is provided to lend rigidity to the structure. A cross brace 44 connecting the brace 42 with the other leg of the U-shaped handle is also provided. To render the device easily transportable a pair of rollers 40 secured to the frame 10 beneath the lower ends of the handle 41 is provided. If desired a suitable container 45 for seals or other needed elements may be secured to the handle.

The device is assembled as shown in Figures 1 and 2 of the drawings with the operating arm 18 of the braking disk 15 extending between the vertical tubes of the handle 41. The rotatable arms 30 are positioned on the open side of the reel so that when they are rotated to the positions shown in dotted lines in Figure 1 no obstructions will hinder the placing of a coil on the reel. This feature is of distinct advantage in that it is not necessary to remove any part of the device in changing coils or in placing a new coil on the reel.

The operation of the automatic braking means will now be described. With the parts in position as shown in Figure 3, the reel is free to rotate. If, however, the disk 15 is rotated slightly the cam surfaces of the flanges 14 and 16 move relative to each other and cause the disk 15 to move away from the block 13. This action forces the brake lining 17 into engagement with the fibre disk 29 of the rotating reel. The frictional resistance between the lining 17 and the disk 29 stops rotation of the reel. It should be noted that the size and pitch of the cam surfaces on the flanges 14 and 16 are such that disk 15 may be rotated but a few degrees, approximately ten degrees, either way from its normal free position, before the elements between the disk and nut 26 tighten up and prevent further axial or rotative movement of the disk.

In operation, a coil of strapping or other material is placed on the reel and held in position by rotating the arms 30 to the operative position shown in Figures 1 and 2. The free outer end 37 of the strapping is passed through the looped end 19 of the brake operating arm 18 and is thus available for use in packaging operations. An outward or outward and upward pull on the end of the strapping causes arm 18 to move into a horizontal or slightly inclined position thereby moving the disk 15 and cam 16 into the position shown in Figure 3 thus releasing the brake and enabling the reel to be rotated by pulling on the free end of the strapping 37. When the free end of the strapping 37 is dropped the arm 18 drops to the position shown in Figure 1, rotating the disk 15 and cam 16 thus applying the brake and stopping rotation of the reel. This feature is of singular advantage in that it prevents overrunning of the reel when no more strapping is needed thus preventing loosening of the coil and the dispensing of more strapping than is needed. Due to the heavy weight and the distribution of the material of the coil considerable inertia is inherent in the loaded reel. In order that its rotation may be easily started it is necessary that it be freely mounted and that no constantly applied frictional devices be used. So that it may be quickly stopped when desired a positive brake is required. I satisfy both these requirements by the use of my automatically operated braking mechanism.

If desired a suitable weighting means may be placed on the outer end of arm 18 but in actual practice I have found that the weight of the arm itself is sufficient to provide the required braking action.

I regard the arrangement of parts by which the operator may take off or place coils of material on the reel by the simple act of rotating the holding arms and by which the operator can effectively control the rotation of the reel simply by grasping and maneuvering the free end

of the material as important features of my invention.

While I have illustrated my invention in connection with a device of particular design, it is obvious to those skilled in the art that details of construction and arrangements of parts may be varied without departing from the spirit of my invention, the scope of which is indicated in the subjoined claims.

Having thus described my invention what I claim is:

1. Apparatus for the dispensing of binding material comprising a reel for the rotatable support of a coil of such material, a spindle supporting said reel, a support, a block fitting against said support and secured thereto by said spindle passing through an aperture therein, a cam surface on said block opposite said support, a braking surface on said reel about said spindle, a disk rotatably mounted on said spindle between said reel and said block and being provided on one side with a braking surface to cooperate with said first mentioned braking surface and on the other side with a cam surface cooperable with said first mentioned cam surface, and means to rotate said disk whereby the relatively moving cams will move said disk axially and force said braking surfaces into engagement with each other, said means comprising an arm having a looped end through which the binding material passes as it issues from said coil.

2. Apparatus for the dispensing of binding material comprising a rectangular frame, a pair of rollers under one end of said frame, a handle comprising an inverted U-shaped member extending upwardly and outwardly from the same end of the frame, an upwardly extending support secured to one side of said frame, a spindle secured to the upper end of said support and extending across said frame, a coil supporting member rotatably mounted on said spindle, braking means to retard the rotation of said member, an operating arm for said means, said arm being pivoted on said spindle and extending between the side members of said handle and being provided with a looped end to receive the free end of the material of the coil.

3. A reel comprising a hub having a plurality of pairs of radially extending axially spaced spokes, the spokes on one face of the reel being longer than the spokes on the other face of the reel, means connecting the outer ends of the shorter spokes with the longer spokes to provide a plurality of circumferentially spaced axially extending bearing surfaces, aligned apertures in the spokes of each pair within said surfaces, rotatable crank-shaped arms having their ends passing through said apertures, the central portions of said arms providing confining surfaces parallel with and opposite to the ends of the longer spokes, means to yieldably hold said arms in operative position, said arms being rotatable to positions entirely within the periphery of said circumferentially spaced bearing surfaces.

4. A strip dispensing apparatus comprising a base, a channel shaped support extending upwardly from said base, a block fitting within said channel member adjacent its upper end, aligning apertures in the base of said channel member and said block, a shouldered spindle passing through said block and member and adapted to clamp said block and member together, a coil holding reel rotatably mounted on the free end of said spindle, a brake element rotatably mounted on said spindle between said block and said reel, cam surfaces on the adjacent walls of said block and said brake member whereby rotation of the latter relative to the former moves the latter into binding engagement with said reel, and an operating arm secured to said brake member and having a looped end through which binding material issuing from a coil on said reel is adapted to pass.

5. A strip dispensing apparatus comprising a base having one end adapted to rest on the floor, rollers supporting the other end of said base, a handle extending upwardly from the said other end of said base, a support extending upwardly from said base intermediate the ends thereof, a coil supporting reel rotatably mounted on said support, said upwardly extending support being channel shaped, a block within the upper portion of said support, a spindle supporting said reel passing through said block and support and adapted to clamp said block and support together, and a brace extending from the upper portion of said handle to said block.

6. Apparatus for the dispensing of binding material comprising a support, a block, said support and block having registering apertures, a spindle having a shoulder engaging a surface of said block opposite said support and passing through said block and support, means engaging said spindle on the side of said support opposite said block to clamp said support, block and spindle together, a coil supporting reel mounted on said spindle adjacent the end thereof opposite said support, a friction surface on said reel, a member rotatable on said spindle between said reel and said block and having a friction surface to engage the friction surface on said reel, a cam on said block, and a cam on said member adapted to coact with said first mentioned cam to move said friction surfaces to interengagement upon rotation of said member relative to said block and spindle.

7. Apparatus for the dispensing of binding material comprising a rectangular frame, a pair of rollers under one end of said frame, a handle comprising an inverted U-shaped member extending upwardly and outwardly from the same end of the frame, an upwardly extending support secured to one side of said frame, a spindle secured to the upper end of said support and extending across said frame, a coil supporting member rotatably mounted on said spindle, and a brace rigidly connecting the upper portion of said upwardly extending support with both legs of said handle.

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