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DISPENSER FOR STRAND MATERIAL

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2 Sheets-Sheet 1

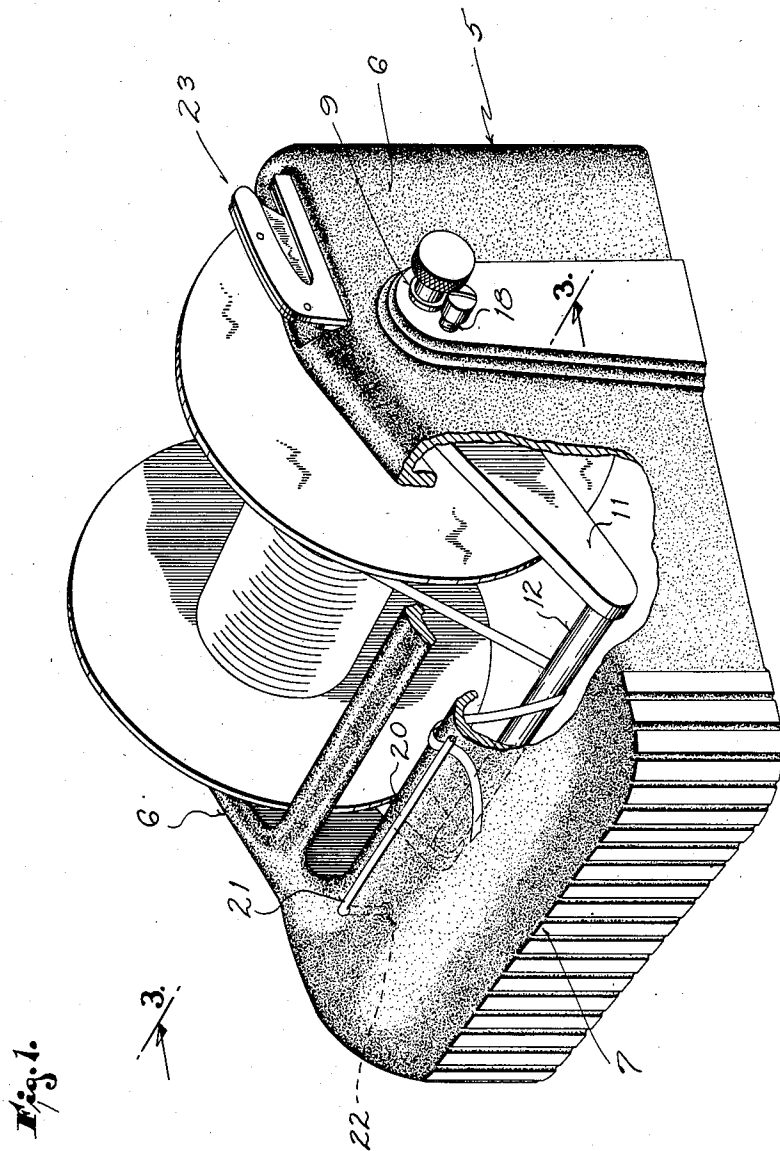


Fig. 1.

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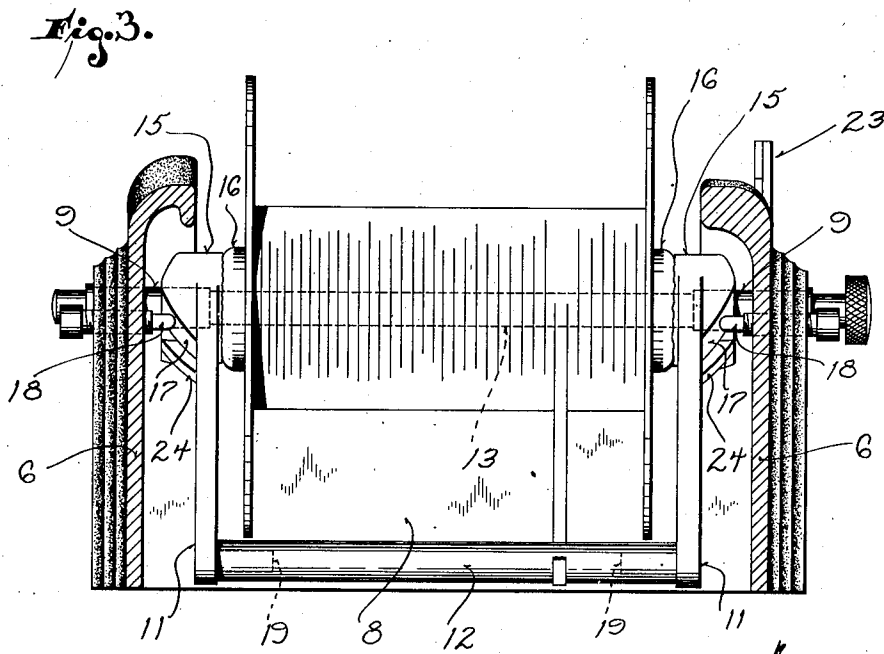
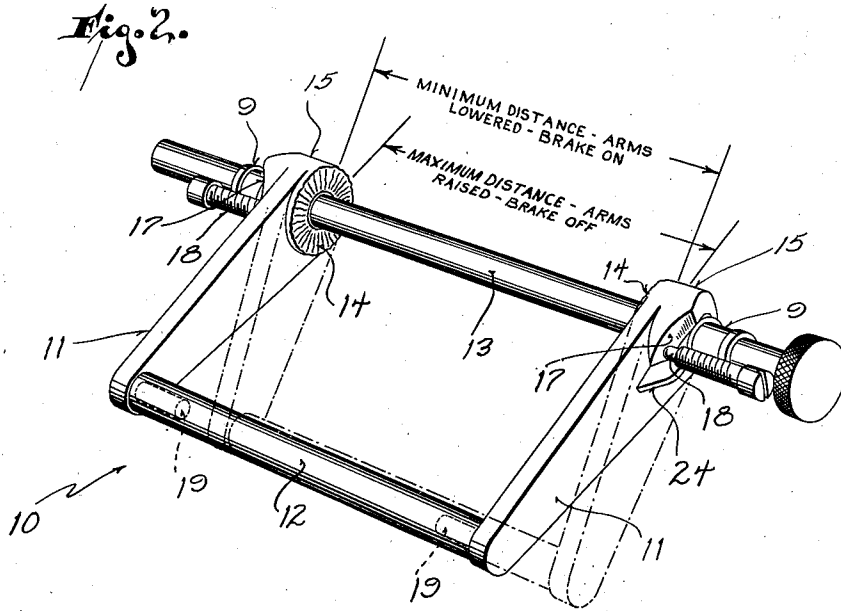
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2 Sheets-Sheet 2



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DISPENSER FOR STRAND MATERIAL

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9 Claims. (Cl. 242-75)

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This invention relates to dispensers for strand material wound upon spools and has as its object to provide a dispenser equipped with a simple brake device or snubber to prevent undesired or free rotation of the spool.

While dispensers equipped with spool brakes or snubbers have been available in the past, they have been structurally complicated and not entirely reliable. It is, therefore, the purpose of this invention to overcome these advantages of past dispensers. This objective is achieved through the use of a simple cam mechanism capable of automatically applying the brake or snubber when the withdrawal of the strand material ceases, and operable to release the brake or snubber the instant tension is applied to the strand material to effect withdrawal thereof.

With the above and other objects in view, which will appear as the description proceeds, this invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the hereindisclosed invention may be made as come within the scope of the claims.

The accompanying drawings illustrate one complete example of the physical embodiment of the invention constructed according to the best mode so far devised for the practical application of the principles thereof, and in which:

Figure 1 is a perspective view of a dispenser constructed in accordance with this invention, a part thereof being broken away to illustrate structural details;

Figure 2 is a perspective view of the brake or snubber per se and illustrating the manner in which it functions to apply a braking action; and

Figure 3 is a cross sectional view through the dispenser taken substantially on the plane of the line 3-3.

Referring now particularly to the accompanying drawings, the numeral 5 designates the base or body of the dispenser, which is preferably a casting having side walls 6 connected by front and back walls 7 and 8, respectively. The bottom of the base or body is entirely open and the top is substantially open. The side walls 6 have coaxially aligned bearings 9 mounted therein, the inner ends of which protrude from the side walls to pivotally mount a yoke-like brake or snubber device indicated generally by the numeral 10 and comprising a pair of arms 11 connected by a cross bar 12.

A spindle 13 removably received in the bearings

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9 provides means for rotatably supporting a spool of the strand material to be dispensed between the arms 11 of the brake or snubber device. It is to be noted that the inner faces 14 of the hubs 15 at the pivoted ends of the arms 11 lie inwardly of the adjacent ends of the bearings 9 so that the ends of the core 16 of the spool may engage the faces 14 when the spool is in position.

The hubs 15 have cams 17 on their outer faces to coact with stationary cam elements or followers 18 on the side walls 6. The surfaces of these cams 17 are so disposed that downward movement of the free ends of the arms 11 connected by the cross bar 12 entails movement of the hubs 15 toward each other. Thus the force of gravity biasing the yoke-like brake or snubber device in a counter-clockwise direction of rotation, as viewed in Figures 1 and 2, brings the inner faces 14 of the hubs into frictional engagement with the ends of the spool core 16. The inner faces 14 are preferably radially serrated or otherwise roughened to assure a good frictional grip between them and the ends of the spool core, and the weight of the yoke-like brake or snubber device is sufficient to cause the surfaces 14 to grip the ends of the spool core.

Attention is directed to the fact that the tendency of the spool to continue to spin after a length of the strand material has been withdrawn increases the grip of the braking surfaces, or in other words, effects a self-energizing brake action.

The stationary cam elements or followers 18 are preferably in the form of screws threaded into tapped holes in the sides of the base to enable adjustment of the nominal spacing between the faces 14 to accommodate spools of different length. Inasmuch as the connecting bar 12 is relatively loosely joined to the free ends of the arms 11, as by having pins 19 extending inwardly from the arms received within the bar 12 which is tubular, the connection of the free ends of the arms does not interfere with the adjustment of the nominal spacing between the brake faces 14.

The brake or snubber action is released during withdrawal of the strand material from the spool by virtue of the fact that the free end of the strand material is looped under the bar 12 and then up over the rounded rear edge 20 of the front wall 7. To hold the free end of the strand material in position on the rounded edge 20 it passes under a guide bar 21. This guide bar consists of a U-shaped wire having its ends projected downwardly through holes in the base so that the guide bar has a degree of upward movement, but by its weight lies on the free end of strand material.

Upsetting the ends of the U-shaped guide bar as at 22 holds the bar assembled with the base.

It will be readily seen that in operation tension applied to the strand material to withdraw a length thereof from the spool applies an upward lifting force on the cross bar 12, thereby in effect disabling the cams 17 and releasing the brake by allowing the distance between the brake surfaces 14 to increase. As long as tension is maintained on the strand material, the cross bar 12 and consequently the arms 11 are held up in the full line position shown in Figure 2 permitting free rotation of the spool. However, the instant the tension on the strand material ceases the cross bar 12 and its connected arms 11 drop by gravity to a position indicated in dotted lines, in Figure 2, during which motion the cams 17, reacting against the abutments 18 force the brake surfaces 14 against the ends of the spool core 16, and with such engagement rotation of the spool is immediately arrested.

To enable the arms 11 of the brake or snubber device to be made as identical castings and merely reversed when assembled with the cross bar 12, a stop fin 24 projects from the cam face of each arm to collide with the adjacent stationary abutment 18 and define the limit of movement of the arms in their brake releasing direction. In other words, the fins 24 prevent travel of the arms 11 beyond the point of declination of the cams.

For convenience in cutting off a desired length of strand material one of the side walls of the base has a knife unit 23 mounted thereon.

From the foregoing description taken in connection with the drawings, it will be readily apparent that this invention provides a simple and practical brake or snubber attachment for dispensers of strand material wound on spools.

I claim:

1. A dispenser for strand material wound upon a spool, comprising: the combination of means for rotatably supporting the spool; a brake comprising spaced apart parallel braking surfaces each engageable with one end of the spool so that rotation of the spool is arrested by movement of said braking surfaces toward each other; cam means including cooperating movable and stationary elements for urging the braking surfaces toward each other; means biasing the movable element of the cam means in a direction to urge said braking surfaces toward each other to thus effect engagement of the brake; and means operable upon the cam means to effect release of the brake, said means comprising a part positioned to be acted upon by strand material being withdrawn from the spool and operable thereby upon the application of tension to the strand material during its withdrawal from the spool to shift the movable element of the cam means to an inactive position and thus free the spool for rotation unhindered by the brake as long as tension is maintained on the strand of material being withdrawn.

2. A dispenser for strand material wound upon a spool, comprising: a pair of spaced spindle supports; a spindle removably mounted in said supports and on which the spool is rotatably mounted between the supports so that the spool is readily removable by withdrawal of the spindle; an arm pivoted to turn about an axis parallel and adjacent to the spindle, said arm being located between one end of the spool and the adjacent spindle support and said arm being biased to swing about its support in one direction; complementary movable and stationary cam elements carried by said arm and the adjacent spindle sup-

port and operable in response to swinging motion of the arm in the direction in which it is biased to effect movement of the arm away from the said spindle support and toward the spool; a braking surface on the inner face of the arm engageable with the adjacent surface of the spool; and means on the arm positioned to have force applied thereto by the strand material when tension is applied to the strand material to withdraw it from the spool, said force moving the arm in the direction opposite to that in which it is biased to thus actuate the cam means in a manner to effect release of the brake.

3. In a dispenser for strand material wound upon a spool, an automatic snubbing device for preventing undesired rotation of the spool, comprising: a pair of arms pivoted to swing about an axis passing longitudinally through the hub of the spool and positioned to embrace the spool endwise so that the hubs of said arms are adjacent to the ends of the hubs of the spool; cam means operable upon the hubs of the arms and biased to force the arms toward each other to grip the spool hub therebetween, the biasing force being released by swinging of the arms upwardly; and means connecting the free end portions of the arms and positioned to be engaged by strand material being unwound from the spool to be lifted thereby upon the application of tension to the strand material, so that as long as unwinding tension is maintained the spool is free from the braking effect resulting from its being clamped between the hubs of the arms.

4. A dispensing device for strand material wound upon a spool, comprising: a spindle upon which the spool is rotatably mounted; supporting walls for the spindle spaced axially along the spindle a distance greater than the length of the spool, each of said supporting walls being adapted to react against axial thrust imposed upon the spool from the opposite direction; cam means between one of the supporting walls and the adjacent end of the spool, said cam means comprising cooperating stationary and movable elements, the stationary element being adjustably secured to the adjacent supporting wall for movement toward and from the opposite supporting wall; means for so adjusting said stationary element to accommodate the device to spools varying in length, between limits, from the nominal spool length for which the device is designed and the slope of the cam means being such that movement of the movable element in one direction forces the spool toward said other supporting wall to effect endwise clamping of the spool between the supporting walls to thereby brake rotation of the spool while movement of the movable cam element in the opposite direction frees the spool from such braking effect; and means connected with said movable cam element and having a part acted upon by the strand being unwound from the spool to move said cam element in said second designated direction in response to tension applied on the strand.

5. In a dispenser for strand material wound upon a spool, an automatic snubbing device for preventing undesired rotation of the spool, comprising: a pair of arms pivoted to swing about the axis of the spool and positioned to embrace the spool endwise so that the hubs of said arms are adjacent to the ends of the hub of the spool; cam means operable upon gravity produced motion of the arms for forcing the hubs of the arms toward each other to grip the spool hub therebetween; and means connecting the free end

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portions of the arms and positioned to be engaged by strand material being unwound from the spool to be lifted thereby upon the application of tension to the strand material, so that as long as unwinding tension is maintained the spool is free from the braking effect resulting from its being clamped between the hubs of the arms.

6. In a dispenser for strand material wound upon a spool, the combination of: a base having spaced side walls, a spindle mounted in said side walls on which the spool is rotatably journaled; a pair of arms pivoted to swing about an axis passing longitudinally through the hub of the spool on the spindle; the hubs of said arms lying between the ends of the spool and the adjacent side walls of the base; a cam surface on the outer face of the hub of at least one of said arms; a cam engaging abutment on the adjacent side wall engaging said cam surface; the direction of the slope of said cam surface being such that rotation of the arms in one direction about their pivotal support effects a reduction in the distance between the hubs of the arms to clamp the spool therebetween while rotation of the arms in the opposite direction allows an increase in the distance between the hubs of the arms to free the spool; and means connected with the arms and positioned to be engaged by the strand material being unwound from the spool and to be moved thereby and carry the arms in said last named direction upon the application of unwinding tension, so that as long as the strand material is being withdrawn from the spool the hubs of the arms are spaced apart sufficiently to permit free rotation of the spool.

7. The combination recited in claim 6 characterized by the provision of means for adjusting said cam engaging abutment to enable adjustment of the nominal distance between the inner faces of the hubs of the arms.

8. In a dispenser for strand material wound upon a spool, the combination of: a base having spaced side walls; a spindle mounted in said side walls on which the spool is rotatably journaled; a pair of arms pivoted to swing about the axis of the spindle; the hubs of said arms lying between the ends of the spool and the adjacent side walls of the base; cooperating cam elements on the outer face of the hub of at least one of said arms and the adjacent side wall, said cam elements being operable upon rotation of the arms in one direction to effect a reduction in the dis-

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tance between the hubs of the arms to clamp the spool therebetween while rotation of the arms in the opposite direction allows an increase in the distance between the hubs of the arms to free the spool; and means connected with the arms and positioned to be engaged by the strand material being unwound from the spool and to be moved thereby and carry the arms in said last named direction upon the application of unwinding tension, so that as long as the strand material is being withdrawn from the spool the hubs of the arms are spaced apart sufficiently to permit free rotation of the spool.

9. A dispenser for strand material wound upon a spool, comprising: means for rotatably supporting the spool, said means including a spindle and a support for the spindle; cam means adjacent to the inner face of the support so as to lie between the support and the adjacent end of a spool on the spindle, said cam means having cooperating relatively movable elements, one of said elements being carried by said support and being adjustable toward and from the other element to accommodate variations in spool length; a brake connected with the cam means and engageable with the adjacent end surface of a part rotatable with the spool upon relative movement between said cam elements in one direction; and means for effecting an opposite relative movement between said cam elements to thereby relieve the spool from retardation by the brake, said means comprising a member connected with one of said cam elements and having a part positioned to be acted upon by strand material being withdrawn from the spool and operable thereby upon the application of tension to the strand material during its withdrawal from the spool to bring about such opposite relative movement between the cam elements.

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