Feb. 16, 1943. I. V. HITT 2,311,175

BOBBIN BRAKE

Filed July 14, 1941

Fig. 1.

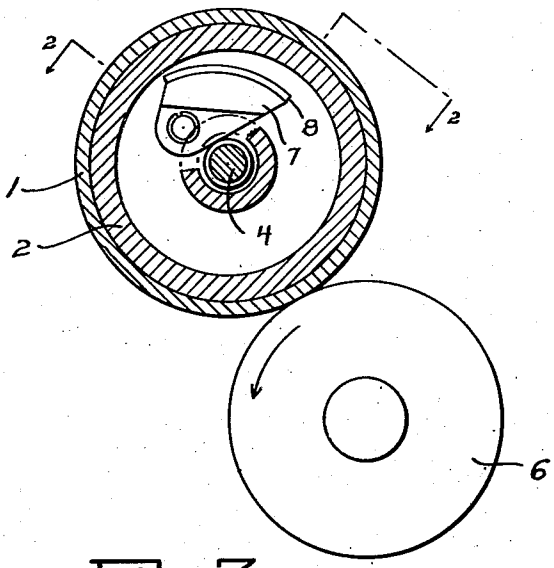


Fig. 2.

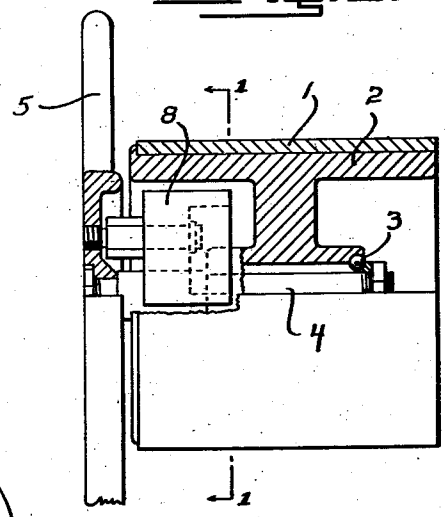


Fig. 3.

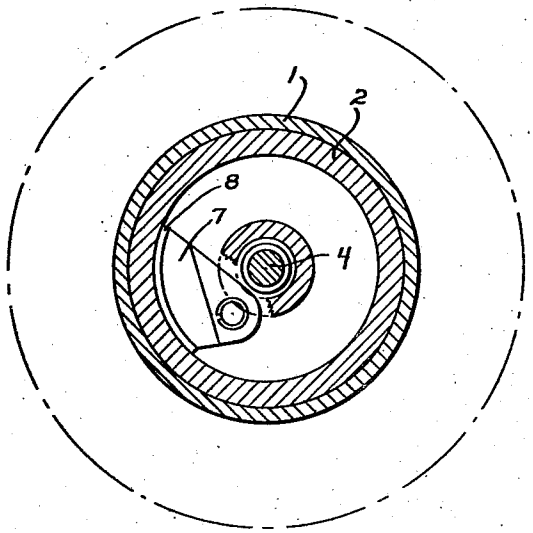
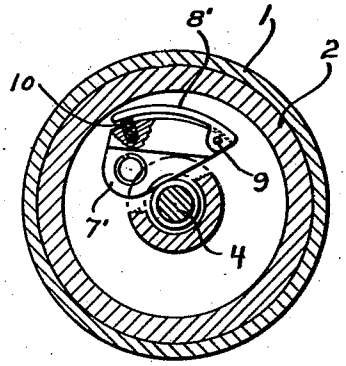


Fig. 4.



INVENTOR.

Ira V. Hitt

BY

ATTORNEY

Patented Feb. 16, 1943 2,311,175

UNITED STATES PATENT OFFICE

2,311,175

BOBBIN BRAKE

Ira V. Hitt, Kenmore, Va., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del., a corporation of Delaware

Application July 14, 1941, Serial No. 402,351

3 Claims. (Cl. 242—36)

This invention relates to the winding of textile yarns and more particularly the means for stopping the rotation of the yarn package when it is moved from its operating position.

In a widely employed method of winding yarn, the yarn package, mounted on a swing arm, is surface driven by frictional contact with a drive roll rotated at constant angular velocity. This method of winding is especially desirable in the winding of freshly formed bundles of artificial filaments, for instance, a bundle of cellulose acetate filaments formed by the dry or evaporative spinning process, since in this way constant drawoff from the spinning cell is easily maintained and therefore uniform denier of the yarn. When the package is completed, i. e., when the core or bobbin is completely filled, it is doffed by merely swinging it away from the drive roll through an arc of 90° or more to a fixed doffing position, removing the full package of yarn and inserting an empty core before returning it to its operating position.

In the winding of relatively small packages of yarn, it has been customary for the operator to retard rotation of the package after breaking contact with the drive roll by merely pressing the end of the core holder with his hand. The rotational inertia is relatively small and rotation of the package can be brought to a stop within a second. However, with the art tending toward larger and larger packages necessitating in some cases heavier core assemblies in addition to the increased yarn weight, the rotational inertia of the winding assembly becomes several times greater. Not only does it take longer to stop the rotation of the takeup yarn package, but in view of the greater mass, the old practice of hand braking becomes unsafe and dangerous to the welfare of the operator.

It is, therefore, an object of this invention to provide a simple automatic means for braking the rotation of the yarn package when winding thereon is completed and when the package is to be doffed.

This object is accomplished by means of a gravity actuated braking shoe pivotally mounted inside the winding assembly so as not to interfere with the rotation of the winding assembly during the winding period, but which automatically becomes operative to retard the rotational speed of the winding assembly as soon as the package is brought into its doffing position on completion of the winding of a yarn package or at any other time when doffing of the core or yarn package is desired.

The invention will be further described in connection with the accompanying drawing wherein—

Fig. 1 is an end section of a winding assembly on the line 1—1 of Fig. 2 and shows a preferred embodiment of the invention in the winding or non-braking position;

Fig. 2 is a front elevation of the winding assembly with parts cut away on the line 2—2 of Fig. 1 to show the brake mechanism;

Fig. 3 is an end section showing the brake in operative position; and

Fig. 4 is an end section showing a modified brake construction.

Referring to Figs. 1 and 2, a conventional bobbin assembly comprising a core 1 and hub 2 is mounted for free rotation, by means of antifriction bearing 3, for example, on the spindle 4 which is fixed to swing arm 5. Swing arm 5 is pivoted at its lower end (not shown) and serves to shift or swing the bobbin assembly first into winding position wherein the bobbin assembly is driven by a positively driven surface drive roll 6, and then into doffing position (Fig. 3) after the yarn package is completed. This winding assembly is essentially the same in construction and operation as that disclosed in U. S. Patent No. 2,150,951. Pivoted to swing arm 5 is a brake comprising a main body portion 7 and a brake shoe 8. The outer surface of the brake shoe is shaped to conform with the adjacent inner surface of hub 2. The mass of the brake is so distributed that the shift in the center of gravity of the mass occasioned by movement of shift arm 5, will cause the brake to operate as hereinafter explained.

In the modified construction shown in Fig. 4, the brake shoe 8' is pivoted at one end by pin 9 on the main body portion 7' and at the opposite end it is pressed outwardly by spring 10 pocketed in the main body portion 7'. Spring 10 serves to energize shoe 8' in its braking action to the point where the brake substantially locks the hub 2 and core 1, when the assembly is in the doffing position.

The operation of the brake is very simple. It remains pressed against the stationary spindle as shown (Figs. 1, 2, and 4) during the entire winding period but, when the assembly is lifted away from the drive roll and swung into the doffing position (Fig. 3), the center of gravity of the brake is moved to the other side of the pivot point and the brake swings by its own weight

against the inner rotating surface of the hub portion of the bobbin assembly and almost instantaneously stops the motion of the package. It is thus possible to wind a package of three or four pounds of yarn and, when the package is completed, stop rotation of the windup assembly automatically within a second from the time it is lifted from the drive roll.

It will be understood, of course, that the invention is not restricted to the exact structure described above and shown in the drawing, but is obviously susceptible to the numerous modifications and variations within the skill of the mechanic. Accordingly the invention comprehends all of such modifications and variations falling within the terms and spirit thereof as set out in the following claims.

I claim:

1. In a thread winding mechanism wherein a hollow bobbin assembly, freely rotatable on a fixed spindle, is driven by a positively driven surface drive roll, and wherein the bobbin filled with thread is movable out of contact with said roll for doffing, the improvement which comprises a brake element within said hollow bobbin assembly said element being swingably mounted on a pivot and being so proportioned that when said bobbin assembly is in a winding position the center of gravity of said element is to one side of a vertical line passing through said pivot whereby said element is gravity actuated free of said bobbin assembly, and when said bobbin assembly is in doffing position, the center of gravity of said element is to the opposite side of said vertical line whereby said element is gravity actuated into braking contact with said bobbin assembly.

2. In a thread winding assembly comprising a horizontally disposed, positively driven surface drive roll, a bobbin assembly freely rotatable on a spindle fixed to a pivoted arm said arm being operable to position said bobbin assembly in and out of driving relationship with the drive roll, the improvement which comprises a brake element provided with a brake shoe shaped to conform with an inner surface of said bobbin assembly said brake element being pivotally mounted on said arm and having its mass so distributed with respect to its pivot point that when the bobbin assembly is in driving relationship with the drive roll, the center of gravity of said brake element is to one side of a vertical line passing through its pivot whereby said brake shoe is gravity actuated free of the bobbin assembly, and when the bobbin assembly is out of driving relationship with the drive roll, the center of gravity of said brake element is to the opposite side of said vertical line whereby the brake elements is gravity actuated to a position where the brake shoe frictionally engages the inner surface of the bobbin assembly whereby to prevent the free rotation of the bobbin assembly.

3. A thread winding device comprising an arm mounted for limited movement in a vertical plane and about a pivot at one end thereof, a spindle fixed substantially normal to, and at the opposite end of, said arm, a hollow cylindrical bobbin assembly freely rotatable on said spindle, and a brake element pivotally mounted on said arm to swing within said hollow bobbin assembly, said brake element being so proportioned that its center of gravity is to one side of a vertical line passing through its pivot whereby said brake element is gravity operated to swing into braking contact with the inner wall of said bobbin assembly at one limit of motion of said arm whereby to prevent rotation of said bobbin assembly.

IRA V. HITT.