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[54] **DEVICE FOR BRAKING THE YARN UNWINDING FROM A DISC BOBBIN**

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[58] **Field of Search**..... 242/156, 156.2, 129.8, 242/99, 96; 112/218 R, 218 A, 231; 139/196–200

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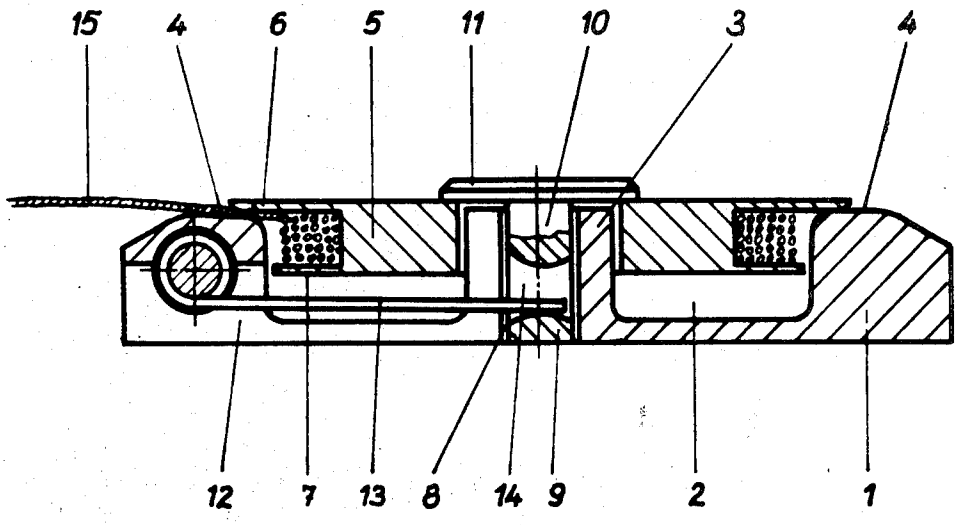
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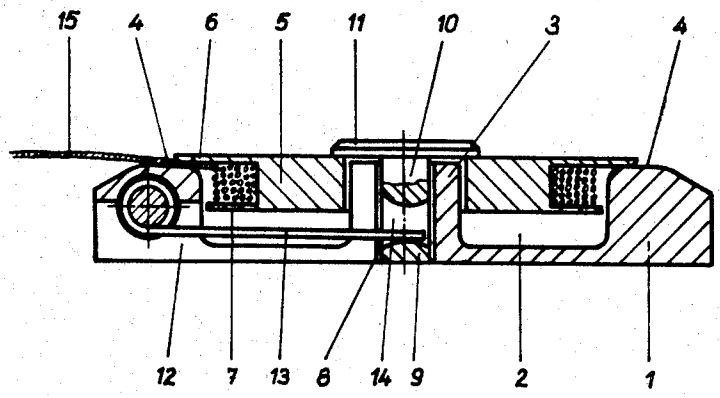
[57] **ABSTRACT**

In combination, a bobbin having a cylindrical surface adapted for winding of a continuous strand thereon, the bobbin comprising means defining a first annular surface, the first annular surface lying in a plane normal to the axis of the cylindrical surface and being coaxial with the cylindrical surface, means for supporting the bobbin for rotation of the bobbin about the axis of the cylindrical surface, means defining a second annular surface, the second annular surface being coaxial with, parallel to and in closely spaced opposition to the first annular surface, means biasing the first and the second annular surfaces toward each other so that the continuous strand when guided between the first and the second annular surfaces is clamped therebetween with a force that holds the strand and the bobbin stationary when the strand is not tensioned from a point outside the bobbin, that permits the bobbin to rotate when the strand is tensioned from a point outside the bobbin and that brakes the bobbin to a halt when the tensioning is discontinued.

3 Claims, 1 Drawing Figure



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DEVICE FOR BRAKING THE YARN UNWINDING FROM A DISC BOBBIN

This invention relates to a device for braking the yarn or other continuous strand unwinding from a disc bobbin, preferably from a disc bobbin on a shuttle of a weaving machine, the disc bobbin being mounted for rotary movement on a bobbin holder, for example a shuttle of a weaving machine, and being rotated by the yarn itself as the yarn unwinds from the disc bobbin.

In a known device for braking the yarn unwinding from a disc bobbin, the bobbin itself is followed by any desired yarn brake, for example, a plate brake consisting of spring-loaded brake discs. Further, it is known practice in a device for braking the yarn unwinding from a disc bobbin to brake the bobbin itself. For this purpose, a braking or retaining means is provided, which checks the rotary movement of the disc bobbin.

These known devices have the disadvantage that the yarn brake, in particular if arranged for example inside a shuttle of a weaving machine, must be designed relatively small, with the result that it is quickly fouled by formation of fuzz and the like. This changes the yarn tension, and yarn ruptures may result. If the disc bobbin itself is braked, there is danger that the last one or several yarn turns on the disc bobbin will come off by themselves by sliding off the disc bobbin after the disc bobbin has been braked to a halt. Thereby the entire purpose of the braking is frustrated and the last yarn turns unwind from the bobbin uncontrolledly. Frequently, therefore, the two devices are combined, that is, the rotary movement of the disc bobbin is braked by a retaining means and the yarn itself unwinding from the disc bobbin passes through a separate yarn brake. This makes the braking of the unwound yarn very costly. When filling a disc bobbin with new yarn, moreover, the yarn must be threaded into the brake, involving further expense.

The object of the invention is to eliminate these disadvantages. Underlying the invention is the object, therefore, of providing a device for braking the yarn unwinding from a disc bobbin which device undergoes continuous self-cleaning and which device, moreover, requires minimal structure in addition to the conventional disc bobbin and bobbin holder.

According to the invention, the brake device for the yarn unwinding from the disc bobbin comprises, in a manner known in itself, at least one limiting, i.e., yarn retaining, disc of the disc bobbin, functioning as a brake area, and a flat area of the bobbin-holder. In a manner known in itself, one limiting disc of the bobbin has a greater diameter than the other limiting disc and the bobbin rests with the flat inner surface of the larger limiting disc on a flat area of the bobbin holder parallel to the flat inner surface. The yarn itself, unwinding from the disc bobbin, is passed between the larger limiting disc of the bobbin and the flat area of the bobbin holder. By the force of a spring or other biasing means the bobbin is pressed with its larger limiting disc against the flat area of the bobbin holder. The bobbin is rotatably mounted, in a manner known in itself, on a pivot pin arranged in an opening in the bobbin holder. The pivot pin has a bore in which is received a push bolt having a head and a shank, the shank having an opening or other means for the engagement of the spring. The head of the push bolt has a greater diameter than the pivot pin. The bobbin-holder further has an opening for receiving the spring, the spring being advantageously a spiral spring. Instead of the spring, other biasing means, for example a magnet, may be employed.

It is known, for example in sewing machines, to make one limiting disc of the disc bobbin of larger diameter than the other limiting disc and of larger diameter than the opening in the bobbin holder, which opening partially receives the disc bobbin, and to let the disc bobbin rest with the larger limiting disc on a flat area of the bobbin holder, as in the present invention, but in such prior art the yarn is not passed between the flat area and the larger limiting disc; instead, for the unhindered passage of the yarn the flat area is provided with a corresponding opening, whereby the effect of the device according to the invention is in no way achieved.

By the use of the device according to the invention, between the flat area of the bobbin holder and the larger limiting disc of the disc bobbin the yarn unwinding from the bobbin is always braked, up to its very end. By the fact that the disc bobbin itself is rotated by the unwinding yarn and thereby a relative movement results between the flat area of the bobbin holder and the larger limiting disc of the disc bobbin, also a self-cleaning of the brake device occurs continuously. Moreover, by the friction between the flat area of the bobbin holder and the larger limiting disc of the disc bobbin there is achieved, in addition to the braking of the yarn itself, a sufficient braking of the disc bobbin in the bobbin holder, especially since the distance of the frictional force acting on the disc bobbin from the axis of rotation of the disc bobbin and hence the brake moment is relatively great. Besides, the advantage results in that a spooled disc bobbin holder and the larger limiting disc of the disc bobbin at a certain point of the circumference are clamped on the yarn during the time in which unwinding of the yarn from the bobbin does not occur. It is thus possible to seize this yarn simply and reliably by suitable means when needed. It will be appreciated that the present invention provides a self-cleaning brake device which is extremely simple in its construction and reliable in its action.

The invention will be further explained with reference to a specific embodiment as illustrated in the drawing which is a section through a bobbin holder as well as the disc bobbin arranged therein.

A bobbin holder **1**, which may be for example the shuttle of a weaving machine, is provided with a recess **2**, in which a pivot pin **3** is arranged. The bobbin holder **1** is provided with a flat area **4**, which is at right angles to the pivot pin **3**. On the pivot pin **3** is rotatably mounted a disc bobbin **5**, which comprises a larger limiting disc **6** and a smaller limiting disc **7**, in such a way that the inner face of the larger limiting disc **6** rests on the flat area **4** of the bobbin holder **1** to which the aforementioned inner face is parallel. The pivot pin **3** has a bore **8**, in which is guided shank **9** of a push bolt **10**. The bolt **10** has a head **11**, the diameter of which is greater than the diameter of the pivot pin **3** and hence greater than the bore in the bobbin **5**. The bobbin holder **1** is further provided with an opening **12**, in which is arranged a spring **13**, which is mounted under tension to produce a clockwise torque and which is engaged in a recess **14** in shank **9** of bolt **10**, thereby to urge the head **11** of the bolt **10** against a peripheral portion of the upper face of the disc bobbin **5** surrounding the bore through the disc bobbin **5**. By the spring **13** the disc bobbin **5** is thus pushed toward the bobbin holder **1**, the larger limiting disc **6** of of the bobbin **5** being

thus pushed against the flat area 4 of the bobbin holder 1. Since a yarn 15 wound on the disc bobbin 4 is passed between the flat area 4 of the bobbin holder 1 and the limiting disc 6 of the bobbin 5, the spring 13 exerts a braking force on the yarn 15 when the latter unwinds from the bobbin 5. The unwinding of the yarn 15 from the bobbin 5 takes place either when the yarn 15 is pulled off it or, if the bobbin holder 1 is the shuttle of a weaving machine, when the yarn 15 is retained at the fabric edge and the shuttle is moved through the shed. Since during the unwinding of the yarn 15 from the bobbin 5, the latter is rotated by the yarn itself, there results also a relative movement between the flat area 4 of the bobbin holder 1 and the limiting disc 6 of the bobbin 5, that is, between the two brake surfaces acting on the yarn 15. This relative movement causes the brake device continuously to clean itself, in that fuzz and the like that has formed is removed, as a result of which the braking effect is constant.

The foregoing description is intended to illustrate rather than limit the scope of the invention as defined by the appended claims.

What is claimed is:

1. In combination, a bobbin having a cylindrical surface adapted for winding of a continuous strand thereon, the bobbin comprising first and second discs formed on the respective ends of the bobbin, the first disc defining a first continuous uninterrupted annular surface, the first annular surface lying in a plane normal to the axis of the cylindrical surface and being coaxial with the cylindrical surface, the first and the second discs both being of greater diameter than the cylindrical surface and the first disc being of greater diameter than the second disc, and a bobbin holder for supporting the bobbin for rotation of the bobbin about the axis of the cylindrical surface, the bobbin holder comprising means defining a cylindrically walled recess of greater diameter than the second disc and of smaller diameter than the first disc, the bobbin being received in the recess with the first annular surface portion of the first disc overlying a second annular surface defined by an annular portion of the surface of the bobbin holder around the mouth of the recess, the bobbin holder further comprising a pivot pin coaxial with the cylindrical wall and the bobbin, the bobbin being provided with a bore coaxial with the cylindrical surface for receiving the pivot pin, the pivot pin being provided with an axial bore, the bobbin holder further comprising a bolt having a shank and a head, the shank being provided with a recess and being received in the bore of the pin and the head being of larger diameter than the bore of the bobbin and resting on the outer face of the first disc, a torsion spring fixed to the bobbin holder and arranged to engage in the recess in the shank and urge the head against said outer face, whereby the first and the second annular surfaces are biased toward each other so that the continuous strand when guided between the first and the second annular surfaces is clamped therebetween with a force that holds the strand and the bobbin stationary when the strand is not tensioned from a point outside the bobbin, that permits the bobbin to rotate when the strand is tensioned from a point outside the bobbin and that brakes the bobbin to a halt when the tensioning is discontinued.

2. A combination according to claim 1, in which the bobbin holder is provided with a recess in which the spring is received.

3. A combination according to claim 2, in which the spring is a helical spring having a helical portion and a free arm extending from the helical portion, the helical portion is received in the recess in the bobbin holder and the free arm is engaged in the recess in the shank.

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