

UNITED STATES PATENT OFFICE.

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BOBBIN BATTERY FOR AUTOMATIC WEFT-REPLENISHING LOOMS.

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The invention has reference to the batteries or magazines employed in automatic weft replenishing looms to hold reserve supplies of bobbins to be transferred on demand to the running shuttle in substitution for exhausted bobbins.

The invention relates particularly to batteries of the type in which the bobbins are placed in a guideway or compartment down which they slide by gravity towards a transfer position from which the lowest bobbin in the compartment is discharged, when called for, to take the place of an exhausted bobbin.

Further, the invention relates particularly to a battery of this type which receives an oscillating or rocking motion to carry the discharge outlet from the battery into and away from a position over a shuttle box containing the shuttle to which a new bobbin is to be transferred. The battery may have two or more compartments to receive bobbins containing wefts of different colour or character and the swinging or oscillating movement may be given to it in synchronism with the movements of a shifting shuttle box motion so that there is always positioned, over the point of replenishment, the discharge outlet of a compartment containing bobbins of the appropriate colour or character.

The invention has for its object to prevent, in a battery of this type, any turning or rotary movement of a bobbin during its movement towards, or during its stay in, transfer position, such as might tend to cause loosening or unwinding of the weft end, and the invention comprises the means hereinafter to be described whereby this object is attained.

One form of battery embodying the invention is illustrated in side elevation at Fig. 1 of the accompanying drawing,

Fig. 2 being a section on the line A—A, Fig. 1, and

Fig. 3 a detail plan view.

The particular battery illustrated comprises a plate *a* mounted for pivotal movement about a central stud, and provided on one face with peripheral flanges *a'*, *a''* and a flanged member *b* spaced from said flanges, to form two open-topped slides or compartments *c* and *d* to receive two sets or series of bobbins *e* and *e'* which may con-

tain wefts of different colour or character. The lower ends of the flanges and flanged member are separated, as shewn, to form a gap or opening *f*, and centrally of this gap or opening there is provided a dividing piece *g*. Secured to the respective flanges *a'*, *a''* are spring members *h*, *h'* which, with the dividing piece *g*, form two throats or outlets *f'* and *f''* through which bobbins from the respective compartments may be discharged from the battery.

The back plate *a* of the battery has an arm *a''* by means of which, through suitable connections, the battery can be rocked or oscillated, in synchronism say with the movements of a shuttle change box motion, to present either of the outlets *f'* or *f''* above a stationary shuttle box.

The bobbins in the two compartments move down by gravity towards the lower ends of the compartments, the lowest bobbin in each compartment resting or being supported at the entrance to the outlet in a position to be forced out, past the spring *h* or *h'*, by the usual transferer which, as it is well known and forms no part of the invention it has not been deemed necessary to shew. It will be understood that a bobbin will be discharged from one or the other of the compartments according as the battery be oscillated to position the discharge opening of a particular compartment beneath the transferer.

It has been found in practice that, in a battery of this description, there is a tendency on the part of the weft ends of the bobbins to become unrolled or loosened as the bobbins move down by gravity towards the transfer position and further that during the time a bobbin is in transfer position, in which it may remain for an extended period, the vibration of the loom or the rocking movements or oscillation of the battery, or both, tend to cause the bobbin to turn or rotate about its axis, thus tending to unwind, or to unwind further, the weft end.

Our object, as before stated, is to obviate the tendency of the weft ends to become loosened or unwound as the bobbins move towards transfer position and during the time they are in transfer position.

According to our invention, we provide in each compartment of the battery a con-

tinuous curved rib c' or d' appropriately positioned between the flange a' or a^2 forming the outer side of a compartment and the member b forming the inner side of same, and we form in the base of each bobbin a transverse slot B' extending diametrically across the base thereof adapted to fit and slide over the rib referred to.

When inserting the bobbins into the open upper end of a compartment, the slots in their bases are passed on to the rib and as the bobbins gradually descend towards transfer position they slide down the rib and are prevented thereby from turning so that vibration or the rocking movements of the magazine do not affect them.

The rib of a compartment terminates at the lower end a short distance away from the discharge outlet so that a bobbin, on arriving at transfer position rolls clear of the rib into the path of the transfer hammer. To prevent any turning or rotation of the bobbin during the time it is in transfer position, we provide the dividing piece g with a projection g' or g^2 at each side, and opposite the end one B^2 of the usual rings provided on the butt of the bobbin to co-operate with a spring in the shuttle to cause the bobbin to be retained in the shuttle.

When a bobbin drops into transfer position, the projection g' or g^2 extends into the gap between the ends of the end ring of the bobbin, as shown in Fig. 1 or, if the bobbin does not happen to present itself in such a position that the projection can enter the gap immediately, the projection will so enter if and when the bobbin has turned the necessary amount to present the gap referred to opposite the projection. Thereafter, the bobbin is restrained against any further turning movement whatever length of time it may remain in transfer position.

It is found sufficient, and we prefer, to arrange for the projection g' or g^2 to engage only the gap between the ends of the end ring of the bobbin butt. The width of the projection might be such however, as to extend over all the rings, in this instance three in number, on the bobbin butt, so as to co-operate with that gap between the ends of a ring which might first be presented.

It will be observed that the tendency towards loosening or unwinding of the weft end of a bobbin depends largely upon whether the weft is wound upon the bobbin weft-way or twist-way, and that consequently it may only be actually necessary to provide a holding projection on one side of the dividing piece. It is preferred however, to provide each side with a holding projection.

We have described the projection on the dividing piece as co-operating with a gap between the ends of a ring on the bobbin butt. It may, however, equally well co-operate with a notch or recess in the butt itself,

when the butt is not provided with rings in the manner referred to. Further, the projection for holding a bobbin when in transfer position has been described as being formed on a dividing piece between two compartments. The projection might however be formed on one side of the outlet passage of a single compartment battery.

From the above description it will be apparent that we have provided means, of very simple construction, which, in a battery of the type concerned, will prevent absolutely any turning or rotation of the bobbin, from the time it is inserted to the time it is discharged, such as would tend to loosen or unwind the weft end.

It will be apparent that, although the invention is illustrated in connection with a particular form of battery it is applicable to any type of battery in which the bobbins descend by gravity towards a discharging or transfer position.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. A battery for automatic filling replenishing looms comprising a plate having parallel flanges presenting a compartment to receive the butts of a plurality of superimposed bobbins and having an end wall presenting a central longitudinally extending rib to engage diametrical recesses upon the butts of the bobbins and to prevent rotation of the bobbins during their passage through the compartment.

2. A battery for automatic filling replenishing looms comprising a pivotally mounted plate having a plurality of pairs of flanges presenting compartments each adapted to receive the butts of a plurality of superimposed bobbins and each having a longitudinally extending rib located substantially midway of the flanges forming the walls of the respective compartments to enter complementary transverse slots in the bobbin butts and to prevent rotation of the bobbins during their passage through the compartment.

3. A battery for automatic filling replenishing looms comprising a pivotally mounted plate having a plurality of pairs of oppositely disposed, substantially semi-circular, parallel flanges presenting compartments each adapted to receive the butts of a plurality of superimposed bobbins, a substantially semi-circular rib, intermediate of the flanges forming the walls of each compartment extending longitudinally of the compartment in parallelism with said flanges, adapted to enter complementary transverse slots in the bobbin butts and to prevent rotation of the bobbins during their passage through the compartment.

4. A battery for automatic filling replenishing looms comprising a pivotally mount-

ed plate having a pair of parallel flanges presenting a compartment to receive a plurality of superimposed bobbins and a discharge throat for said bobbins beyond the lower end of said compartment, means for retaining the lowermost bobbin in said throat in transfer position including a spring carried by one of said flanges positioned to engage the butt of the bobbin and a rigid member carried by said plate positioned to engage the bobbin butt substantially diametrically opposite to the engagement thereof by said spring and having a projection to enter the gap between the ends of a bobbin ring.

5. A battery for automatic filling replenishing looms comprising a pivotally mounted plate having a plurality of pairs of parallel flanges presenting compartments adapted respectively to receive a plurality of superimposed bobbins, discharge throats for said bobbins beyond the lower ends of said compartments having a common dividing wall carried by said plate and provided upon opposite sides with a rib to enter the gap between the ends of rings of bobbin butts positioned for transfer in the respective discharge throat and resilient means for hold-

ing the respective bobbin butts against said dividing wall.

6. A battery for automatic filling replenishing looms comprising a pivotally mounted plate having oppositely disposed pairs of parallel, substantially semi-circular, flanges presenting compartments to receive a plurality of superimposed bobbins, a rib, extending longitudinally of each compartment in parallelism with the flanges forming the walls thereof and substantially midway thereof, adapted to enter transverse recesses in the bobbin butts introduced into such compartments, discharge throats, for the bobbins of the respective compartments, having a common dividing wall provided with oppositely extending ribs to enter the gap between the ends of the bobbin rings at the ends of the respective bobbin butts and resilient means for forcing the respective bobbin butts when in the discharged throat against the dividing wall, whereby the bobbins will be retained in the respective throats in position for transfer and rotation of the bobbins when thus positioned will be prevented.

In testimony whereof I affix my signature.
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