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[33] **Switzerland**
[31] **No. 10646/67**

[54] **APPARATUS FOR CHARGING A TEXTILE MACHINE WITH CREEL BOBBINS OR THE LIKE**
14 Claims, 7 Drawing Figs.

[52] **U.S. Cl.** 214/307; 198/53
[51] **Int. Cl.** **B65b 21/02**
[50] **Field of Search** 214/300, 307, 309; 198/53, 55, 54, 43; 139/245, 246

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Primary Examiner—Hugo O. Schulz
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ABSTRACT: An apparatus for charging a textile machine with creel bobbins, or the like, especially a winding machine or loom, which is of the type comprising lifting means for the removal of bobbins from a supply container. The lifting means comprises a transport device, for instance in the form of an endless transport band or chain, arranged at an inclination with respect to the vertical. A pair of platform members are disposed in spaced and superimposed relationship with respect to one another. Means serve to mount the platform members so as to be displaceable relative to the transport device. These platform members are located transverse with respect to the transport device, for instance either substantially perpendicular thereto or in such a manner as to enclose an acute angle which opens towards the top. A respective supply container for the bobbins is removably mounted at each platform member. Each of the supply containers has an opening at the side facing the transport device. Further, positioning means controllable as a function of the depletion of bobbins in one of the supply containers and the loaded condition of the transport device with bobbins are operably connected with the platform members for bringing about in dependency upon one another an alternate positioning of the respective platform members and the respective supply containers located thereon at the transport device.

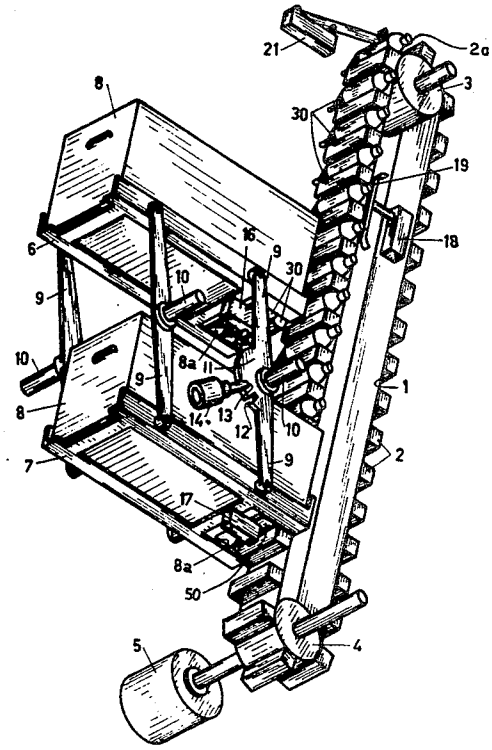

Fig. 1

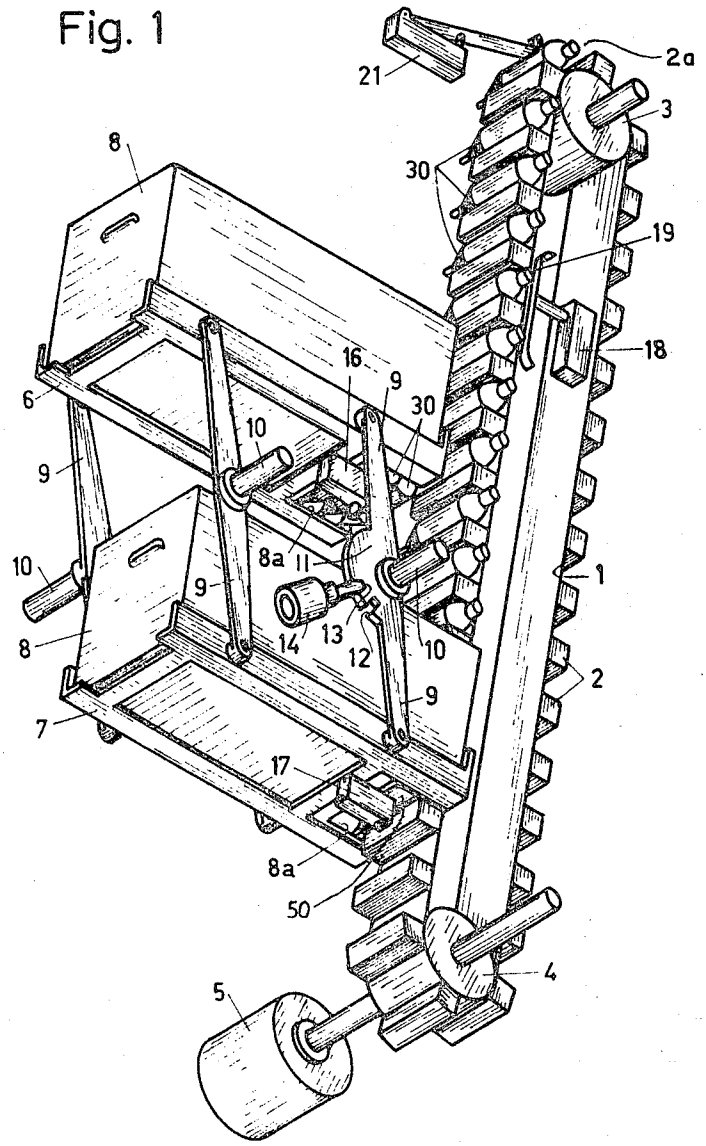

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Fig. 2

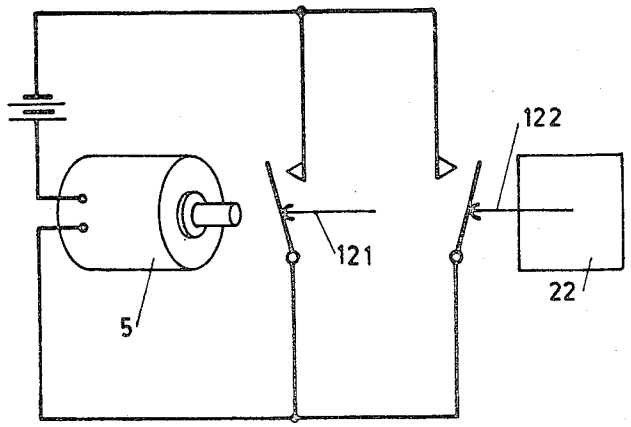
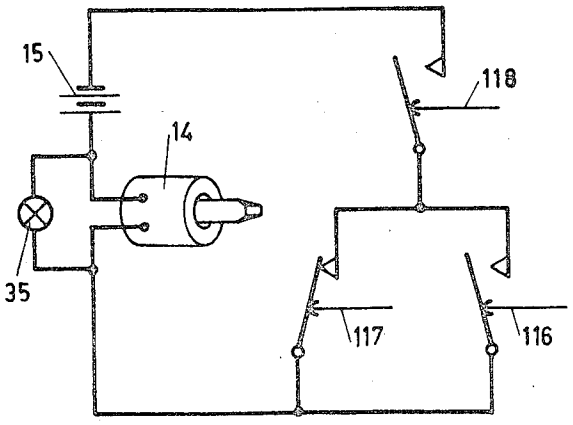


Fig. 3



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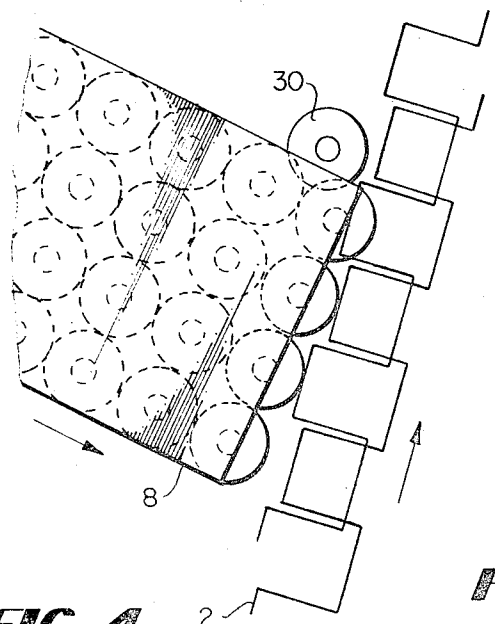

FIG. 4

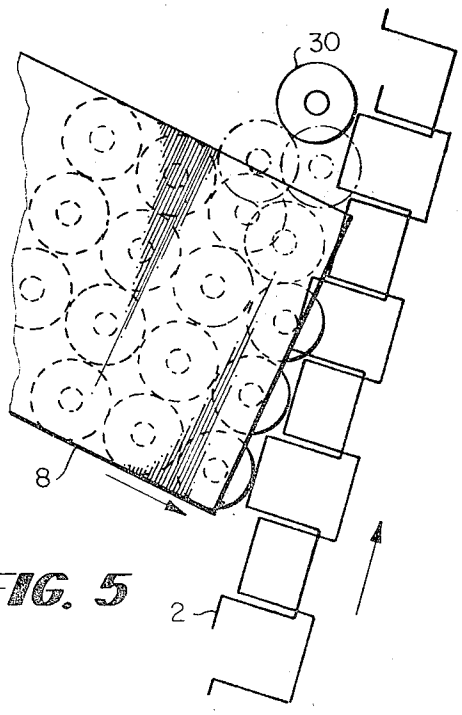

FIG. 5

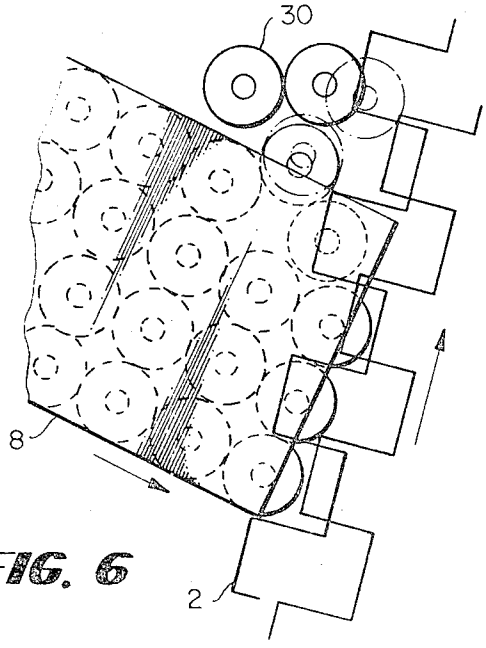

FIG. 6

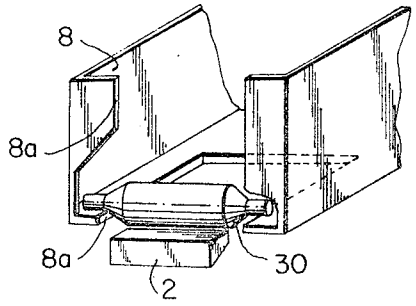

FIG. 7

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APPARATUS FOR CHARGING A TEXTILE MACHINE WITH CREEL BOBBINS OR THE LIKE

BACKGROUND OF THE INVENTION

The present invention relates to an improved apparatus for charging or loading a textile machine with creel bobbins or the like, especially winding machines or looms.

There are already known to the art winding machines equipped with automatic cop exchange devices and looms having automatic weft bobbin-exchange devices. In such type equipment the creel bobbins (cops or weft bobbins)are individually removed from a magazine and, depending upon requirements, delivered to a preparatory container. At this location, then, there occurs the knocking in of the creel bobbins into the shuttle or the transfer of the creel bobbins to a winding station or location. In this instance, the cops are manually deposited into the compartments of the magazine or removed and transferred from a supply container by means of a lifting device or an elevator.

What is disadvantageous with both techniques of supplying the relevant machines with creel bobbins is the resulting "-down times" which occur at the machine after depletion of the supply of cops or the like at the supply container or magazine. As a general rule, this depletion of cops or the like is signaled in a suitable manner in order to make an operator aware of the fact that he has to refill the supply of bobbins or cops. With this type system it is necessary, in order to prevent longer down times, to considerably reduce the number of machines which have to be supervised by an operator.

SUMMARY OF THE INVENTION

Accordingly, the present invention is concerned with the provision of an improved apparatus which allows for the charging or loading of a textile machine with creel bobbins or the like in a considerably more rational and controlled manner.

Still, a further significant and more detailed object of the present invention relates to an improved apparatus for charging a textile machine with bobbins or the like in a highly efficient and reliable manner, resulting in less down times and a much better control of the charging operation, so that a supply of bobbins will always be available for the associated textile machine.

Another important object of the present invention relates to an improved apparatus for reliably, quickly and positively charging textile machines with bobbins or the like, wherein the apparatus is relatively simple in construction, extremely reliable in operation, inexpensive to manufacture, requires a minimum of supervision, and is not readily subject to breakdown.

Now, in order to implement these and still further objects of the invention, which will become more readily apparent as the description proceeds, the inventive apparatus for charging or loading a textile machine with creel bobbins, especially winding machines or looms, utilizes a lifting device or elevator for removing the creel bobbins from a supply container or the like According to the invention, the lifting device or elevator may be in the form of an endless transport band or chain which is inclined with respect to the vertical.

The invention contemplates the provision of two platforms which are superimposed and spaced from one another with respect to the inclined arranged transport device. These platforms are mounted to be movable relative to the aforesaid transport device. Furthermore, the platforms serve as support means for a respective removable supply container which is open at the side confronting the transport device. Additionally, these platforms are preferably either disposed perpendicular to the transport device or enclose together with such transport device an acute angle which opens towards the top. Additionally, positioning means, such as especially for instance switching lever means, kingpin means or electromagnetic means, which can be controlled as a function of the empty condition of one of the supply containers and the loaded condition of the transport device, are in operable association or connection with the platforms to bring about an alternate positioning of these platforms and the supply containers supported thereby at the transport device in dependency upon one another.

By virtue of the aforementioned structural arrangement and operational technique it is now possible to maintain a continuous charging or loading of the machine which is to be supervised with creel bobbins or the like since after the automatic retraction of a depleted supply container with simultaneous application of a filled supply container at the transport band or chain of the lifting device or elevator, the entire emptying time for the filled supply container is now available in which to exchange the empty supply container for a full supply container. This enables an operator, in contrast to what was previously possible, to monitor or supervise a considerably larger number of machines and to maintain such in operating condition by properly having supplied thereto full cops or bobbins at the proper time. Thus, it is now completely sufficient to place the full supply container upon the relevant platform, whereupon the application of this container to the lifting device or elevator again takes place automatically after emptying of the other supply container.

According to a preferred embodiment of the inventive apparatus there can be provided at least one blocking or locking device for fixing the operable position of the one or the other platform which has been applied in proper working relationship to the transport device. This locking device can engage with one of the platforms or with the positioning means for the platforms and can be controlled as a function of the empty condition of one of the supply containers and the loaded condition of the transport device. By way of example, the locking device can incorporate a solenoid. This solenoid is then arranged in the electric circuit of a first feeler member for supervising or monitoring the empty condition of one of the us supply containers, a second feeler member for supervising or monitoring the empty condition of the other supply container, and a third feeler member for supervising the loaded condition of the transport device. This locking device is situated at least at the region or zone of engagement of the transport device with the supply container. Furthermore, it is advantageous to provide a signaling device which is connected in parallel with the solenoid, in order to indicate each change of the supply containers with respect to the transport device.

BRIEF DESCRIPTION OF THE DRAWING

The invention will be better understood, and objects other than those set forth above, will become apparent, when consideration is given to the following detailed description thereof. Such description makes reference to the annexed drawing wherein:

FIG. 1 is a schematic and perspective illustration of a preferred embodiment of the invention serving for charging or loading a textile machine with creel bobbins or the like and utilizing two supply containers;

FIG. 2 is a circuit diagram of the electric drive arrangement for the transport band or the like of the apparatus depicted in FIG. 1;

FIG. 3 is a circuit diagram of the electric control device for carrying out an exchange of the supply container at the apparatus shown in FIG. 1;

FIGS. 4—6 depict the movement of the bobbins from the supply containers into the transport band; and FIG. 7 schematically depicts the preferred construction of a typical supply container.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Describing now the drawings, according to FIG. 1 the exemplary embodiment of inventive apparatus for loading or charging a textile machine with creel bobbins or the like, which machine has not been shown by way of convenience in the drawings in order to preserve clarity in illustration, embodies a

lifting device or elevator means, here shown in the form of an endless transport band or chain 1. This transport band 1 is equipped with entrainment ledges 2 or the like and is guided or trained over drum or roller members 3 and 4. Furthermore, the transport band 1 is driven by a suitable drive motor, such as the electric motor 5 which is operably coupled with one of the drum members, such as drum member 4, as shown in FIG. 1. Additionally, the transport band 1 is mounted via the drum members 3 and 4 in a nonillustrated frame of the machine and possesses a slight inclination with respect to the vertical. The inclined arrangement of the transport band 1 is provided for the purpose of preventing the creel bobbins 30 or the like bearing upon the entrainment ledges 2 from dropping out of their associated compartments at the transport band 1 during such time as these bobbins 30 are transported or conveyed upwardly by such transport band 1.

Continuing, it will be recognized that neighboring the aforementioned transport band 1 are two superimposed and spacedly arranged platform members 6 and 7 which are mounted, as will be explained further shortly, to be displaceable transversely with respect to the transport band 1. These platform members 6 and 7 serve as displaceable support means for a respective supply container 8 such as is more clearly illustrated in FIG. 7, or the like. Furthermore, it should be understood that the platform members 6 and 7 are mounted so that they preferrably possess a slight inclination with respect to the transport band 1, and, specifically in such a manner that, the platform members 6 and 7 form or enclose together with the transport band 1 an acute angle which opens towards the top. By virtue of this arrangement it is insured that a supply container 8 which has been placed upon an associated platform member 6 or 7, after such supply container has been applied in its operable position at the transport band 1, is situated closer at its upper edge to the transport band 1 than at its lower edge. This insures for and simplifies the engagement of the entrainment ledges 2 of the transport band 1 with the stack of full creel bobbins or the like located in the relevant supply container 8, as such will be explained in greater detail shortly.

In order to carry out an alternate, mutually dependent application or positioning of the platform members 6 and 7 and, therefore, the supply containers 8 placed upon such platform members 6 and 7, in operable association with or at the transport band 1, there are here provided, for instance, four double-armed lever members 9. These lever members 9 are rotatably mounted by means of their centrally arranged bearing journals or pins 10 at the nonillustrated machine frame. The lever members 9 which extend approximately vertically carry at each upper free end the platform member 6 and at their opposite lower free end the platform member 7, whereby the connections are always carried out to be pivotable.

Thus, and as will be readily apparent by referring to FIG. 1, a rocking or pivoting of the lever members 9 in clockwise direction brings about an application of the upper platform member 6 at the lifting device or elevator 1, for instance in the form of the transport band, and a removal of the lower platform member 7 from such lifting device. On the other hand, a rocking or pivoting of the lever members 9 in the counterclockwise direction causes the upper platform member 6 to be moved away from the lifting device 1 and simultaneously applies the lower platform member 7 to such lifting device. This last-mentioned position of the platform members 6 and 7 together with the supply containers 8 placed thereon, has been depicted in FIG. 1.

In order to be able to fix the platform members 6 and 7 together with the associated supply containers 8 in the one or the other position, the armature of a solenoid 14 or the like selectively engages with locking grooves 12 or 13, for the one or the other position, provided at a segmental disc 11 located at least at one of the lever members 9. This locking device can be, of course, replaced by a different type of locking arrangement, for instance a lever system.

Now, for the purpose of unlocking or releasing the locking device 14 in order to bring about a change in position of the platform members 6 and 7 and the supply containers 8 as a function of the empty condition of one of the supply containers 8 and the loaded condition of the transport band 1, there is provided a first feeler member 16 at the platform member 6 and a second feeler member 17 at the platform member 7. These feeler members 16 and 17 are capable of signaling the empty condition of the associated supply container 8. On the other hand, a further feeler member 18 provided at the transport band 1, as shown in FIG. 1, is capable of directly determining the loaded condition of the transport band 1 above the region of the upper supply container 8 and to signal this condition.

In order to provide the requisite cooperative relationship of the solenoid 14 with the aforementioned feeler members, the solenoid 14 is advantageously arranged in an electric circuit which is supplied by a suitable voltage source 15, such as the battery means . As will be recognized by referring to FIG. 3, the solenoid 14 is connected in series with a contact 118 and with the parallelly arranged contacts 116 and 117 of the feeler members 16 and 17 respectively. By referring to the circuit of FIG. 3, it should be apparent that an unlocking operation due to response of the solenoid 14 can only then occur when the feeler element 18 of the feeler member 19 through closing of its contact 118, indicates the absence of creel bobbins at the region of the measurement path at the transport band 1 and, at the same time, either the feeler member 16 or the feeler member 17 by closing its contact 116 or 117, respectively, indicates the empty condition of the associated supply container 8.

Now, in order to be able to remove creel bobbins 30 by means of the transport band 1 out of the associated supply containers 8 and in order to be able to determine the empty condition of one of such containers by means of the associated feeler members 16 and 17, respectively, these supply containers 8, as can best be seen in FIG. 7, are each provided at their end faces directed towards the transport band 1 with a cutout or recess portion 50 which slightly exceeds in width the lengthwise extension of the entrainment ledges 2 of the transport band 1 which enter into the containers 8. However, the marginal regions of the cutaway walls of the cutout portion 50 of the containers prevent the bobbins from falling laterally out of the associated container. Furthermore, it will be recognized that the aforementioned cutaway portion 50 at the floor of the relevant container 8 continues for approximately twice the diameter of the bobbins, as indicated by the locations 8*a* at the containers 8 in FIGS. 1 and 7. In these sections 8*a* there engage the feeler members 16 and 17 of the associated supply containers 8.

As already explained, the feeler members 16, 17 and 18 are each equipped with a respective contact 116, 117 and 118, respectively, the closing of which results in the transmission of a signal. In order to achieve such, the feeler members 16 and 17 are provided with a suitable switch key pin or the like just as the feeler member 18 is provided with the switch key or feeler element 19. These switch keys or pins are contacted by the spools or bobbins 30 located in the containers 8, resulting in the associated contact being retained in its open position. Consequently, an absence of bobbins in the relevant container 8 or in the compartments of the transport band 1 located above the uppermost container 8 results in the delivery of a signal.

The mode of operation of the aforedescribed apparatus is as follows: The drive of the transport band 1, as a general rule, occurs in stepwise fashion through the height or width of a compartment of the transport band, in accordance with the requirement for creel bobbins at the machine and in accordance with the loaded condition of the compartment at the transport band 1 which serves to deliver a bobbin to the machine. In FIG. 2, reference numeral 22 designates a preparatory container. If this preparatory container 22 requires a bobbin, then this will be indicated by closing the as-

sociated contact 122, whereupon the electrical circuit for the electric drive motor 5 is closed and the transport band 1 moves further through the spacing of one compartment. As a result, the uppermost or, so-called preparatory compartment 2*a* disposed at the top of the transport band of FIG. 1, can deliver its creel bobbin or the like to any suitable transport means such as depicted in U.S. Pat. No. 3,380,677 which delivers such bobbin to the preparatory container 22. In order to prevent that the preparatory compartment 2*a* at the transport band 1 is empty, a feeler member 21 (FIG. 1) scans this compartment. Thus, if necessary, the feeler member 21 by means of its contact 121, which is arranged parallel to the contact 122 at the electric circuit of FIG. 2, causes the transport band 1 through the agency of the drive motor 5 to remain in motion for such length of time until this feeler member 21 indicates or senses the presence of a creel bobbin 30 at the preparatory compartment of the aforementioned transport band 1.

According to FIG. 1 and as clarified by FIGS. 4—7, in order to load or charge the transport band 1 with creel bobbins 30 from a container 8, this container 8 is, for instance, placed upon the lower platform 7 at the transport band 1, in the position shown in FIG. 1 and FIG. 4, and is locked in this position by means of the solenoid 14. Owing to the revolving motion of the transport band 1 and as shown in FIG. 5, the entrainment ledges 2 of such band 1 individually enter into the associated operably disposed supply container 8, and as depicted in FIG. 6, remove one bobbin after the other out of such supply container and convey such towards the top. The inclined position of the supply container 8 insures that the bobbins which are spaced from the transport band 1 will automatically move towards the transport band 1 until even the last bobbin is engaged and carried away by such transport band 1. Furthermore, the previously mentioned close positioning of the upper edge of the container 8 at the transport band 1 renders possible a relatively gentle pressing of the entrainment ledges 2 into the bobbin stack within the associated supply container 8, as is test illustrated in FIGS. 5 and 6.

If now the last bobbin 30 has been removed from the lower supply container 8, then by virtue of the action of the feeler member 17 there is indicated or signaled the empty condition of this supply container 8 by closing of the associated contact member 117 (FIG. 2.) Now, it is necessary to wait until the transport band 1, at the region of the upper full supply container 8 which should be placed in operable association with the transport band 1, is devoid of bobbins 30. When this condition has been determined by the feeler member 18 located at the transport band 1, then this feeler member 18, via its contact member 118, closes the control circuit of FIG. 3, so that the solenoid 14 is energized and unlocks the associated lever member 9.

Owing to the considerably larger weight of the upper full supply container 8 with respect to the empty lower container, the lever members 9 automatically pivot in clockwise direction without the aid of any additional means. This causes the upper full supply container 8 to be placed in operable association with the transport band 1 and the lower empty container to be removed away from such transport band 1.

Now the transport band 1 is capable of removing further creel bobbins from the upper full supply container 18, whereby at the same time the solenoid 14 is also switched out or deenergized and such solenoid once again locks the lever member 9 equipped with the grooved segment member 11 in the groove position 12. The switching operation at the solenoid 14 can furthermore be simultaneously indicated by a parallelly connected lamp 35 or the like and/or by means of an acoustical signaling device. This will indicate to the operator the depleted condition of one of the supply containers 8, and he can then exchange such depleted supply container 8 for a full one, in order to prepare the apparatus for a new exchange operation of the containers in the aforedescribed manner.

It is here mentioned that not only the platform members but also the positioning means, the locking device and the electrical feeler and switching means, can be replaced by different structural arrangements than those previously described by way of illustration and example. Thus, for instance, each platform member could be constructed to provide a sled which can be properly positioned at the transport band or the like by means of runners or wheels, or equivalent structure, whereby a kingpin or alternately engaging electromagnetic means bring about the alternate proper positioning or placement of the sleds in dependency of one another.

It should be apparent from the foregoing detailed description, that the objects set forth at the outset to the specification have been successfully achieved.

I claim:

1. An apparatus for charging a textile machine, especially a winding machine or loom, with creel bobbins or the like; comprising lifting means for the removal of bobbins from a supply container, said lifting means comprising a transport device arranged at an inclination with respect to the vertical, a pair of platform members disposed in spaced and superimposed relationship with respect to one another, means for displaceably mounting said platform members relative to said transport device, said platform members being positioned substantially transverse with respect to said transport device, a respective supply container for bobbins removably mounted at each platform member, each of said supply containers having an opening at the side facing said transport device, positioning means controllable as a function of the depletion of bobbins in one of said supply containers and the loaded condition of said transport device with bobbins, said positioning means being operably connected with said platform members for bringing about in dependency of one another an alternate positioning of the respective platform members and the respective supply containers carried thereby at the transport device.

2. An apparatus for charging a textile machine with creel bobbins or the like as defined in claim 1, wherein said transport device comprises an endless transport band member.

3. An apparatus for charging a textile machine with creel bobbins or the like as defined in claim 1, wherein said platform members are arranged substantially perpendicular with respect to said transport device.

4. An apparatus for charging a textile machine with creel bobbins or the like as defined in claim 1, wherein said platform members positioned substantially transverse with respect to said transport device enclose an acute angle with said transport device which opens towards the top.

5. An apparatus for charging a textile machine with creel bobbins or the like as defined in claim 1, further including at least one locking means for fixing the position of one or the other of said platform members, said locking means being controllable as a function of the depletion of bobbins in one of said supply containers and the loaded condition of said transport device with bobbins.

6. An apparatus for charging a textile machine with creel bobbins or the like as defined in claim 5, wherein said locking means operably engages with said positioning means.

7. An apparatus for charging a textile machine with creel bobbins or the like as defined in claim 6, wherein said positioning means incorporates a plurality of double-armed lever members, one respective end of each of said double-armed lever members being operably connected to one of said platform members and the opposite respective end of each of said double-armed lever members being operably connected to one of said platform members and the opposite respective end of each of said double-armed lever members being operably connected with the other of said platform members.

8. An apparatus for charging a textile machine with creel bobbins or the like as defined in claim 7, wherein one of said lever members is provided with a segmental disc portion having notches selectively engageable by said locking means.

9. An apparatus for charging a textile machine with creel bobbins or the like as defined in claim 8, wherein said locking means comprises a solenoid selectively engageable with said notches.

10. An apparatus for charging a textile machine with creel bobbins or the like as defined in claim 5, further including control means comprising an electric circuit, said locking means being operably coupled with said electric circuit, said electric circuit incorporating a first feeler means for supervising the depletion condition of one of said supply containers, a second feeler means for supervising the depletion of the other of said supply containers, and a third feeler means for supervising the loaded condition of the transport device at least at its region of operable engagement with said supply containers.

11. An apparatus for charging a textile machine with creel bobbins or the like as defined in claim 10, wherein said locking means comprises a solenoid, said first feeler means being operably associated with one of said supply containers and said second feeler means being operably associated with the other of said supply containers, each of said first and second feeler means incorporating a respective contact member which are connected in parallel at said electric circuit, said third feeler means being arranged at said transport device and incorporating a contact member, said solenoid being operably coupled in said electric circuit in series with both of the parallelly connected contacts of the first and second feeler means and the contact member of said third feeler means provided at said transport device.

12. An apparatus for charging a textile machine with creel bobbins or the like as defined in claim 11, further including signaling means connected in parallel with said solenoid.

13. An apparatus for charging a textile machine with creel bobbins or the like as defined in claim 12, wherein said signaling means comprises a signaling lamp.

14. An apparatus for charging a textile machine with creel bobbins or the like as defined in claim 1, wherein said positioning means comprises at least one double-armed lever member which is pivotably mounted, said double-armed lever member having one arm connected with one of said platform members and the opposite arm connected with the other of said platform members.