

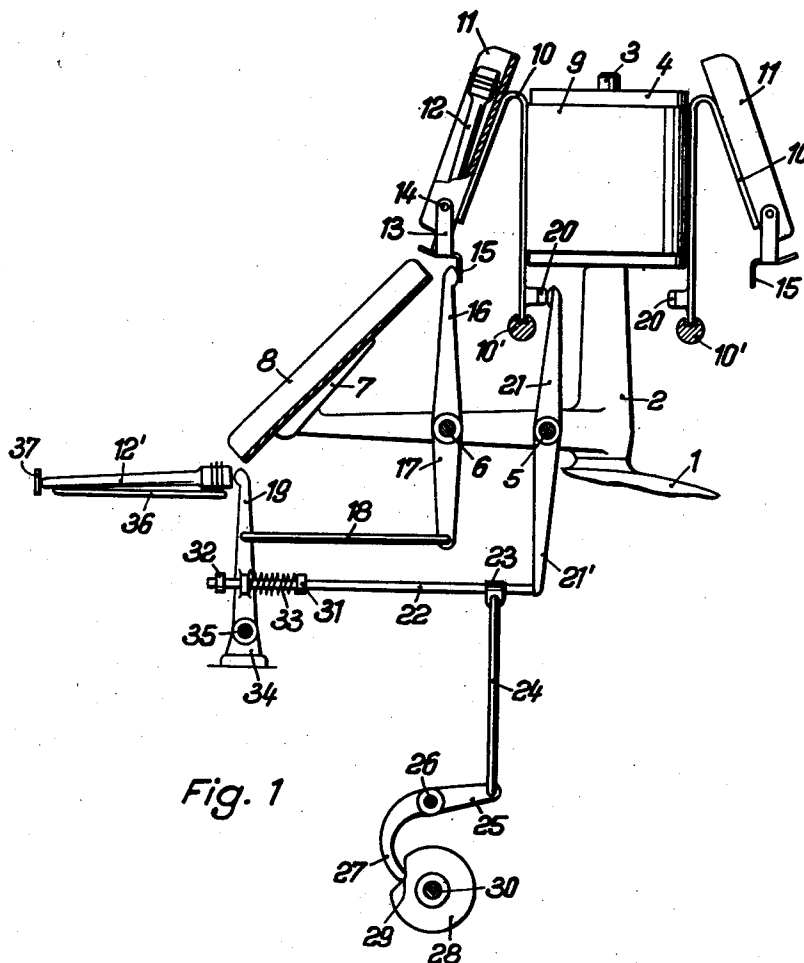
May 3, 1955

S. FÜRST
SPOOL FEEDING DEVICE

2,707,548

Filed March 8, 1952

4 Sheets-Sheet 1



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4 Sheets-Sheet 2

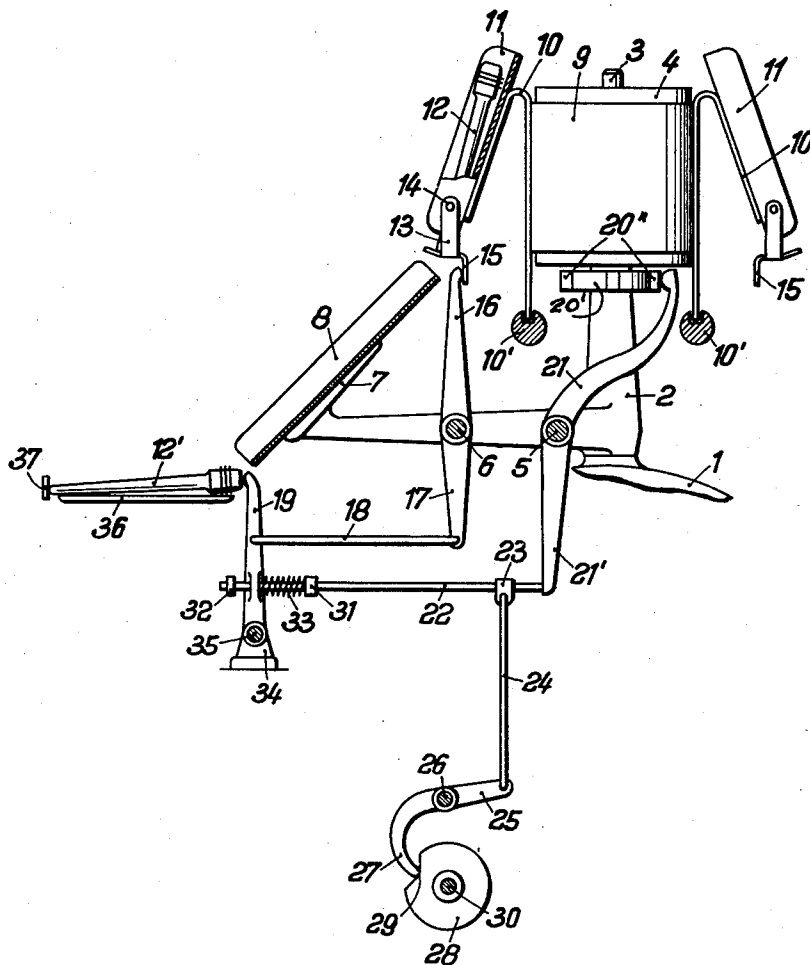


Fig. 2

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SPOOL FEEDING DEVICE

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4 Sheets-Sheet 3

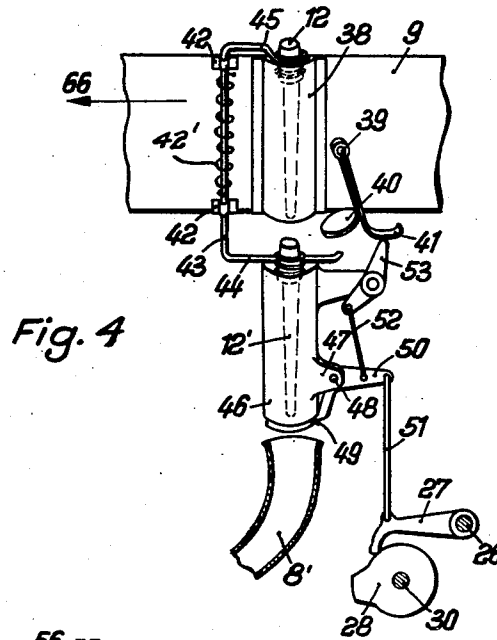


Fig. 4

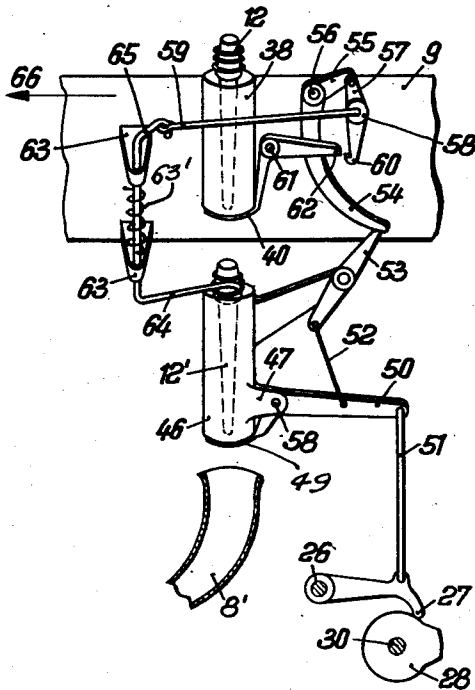


Fig. 3

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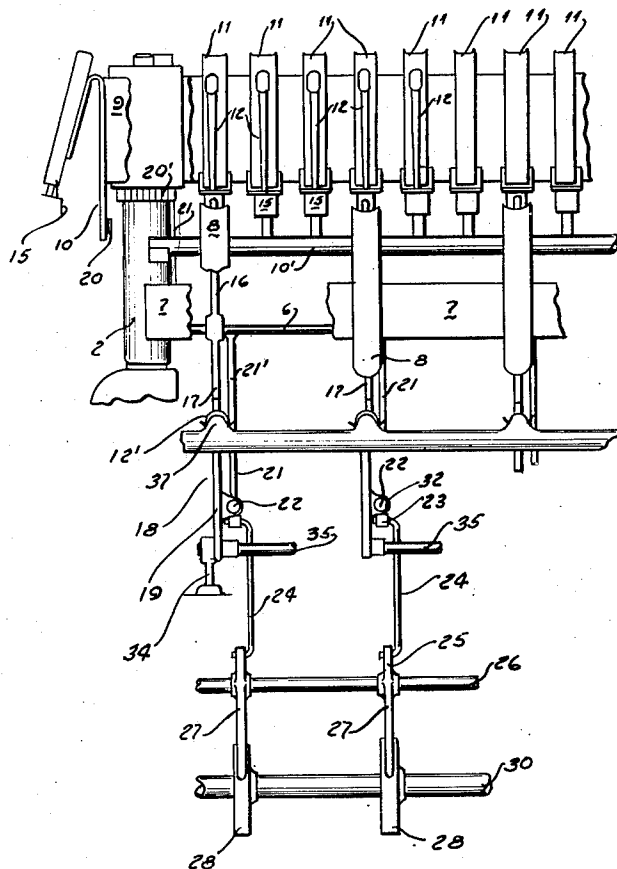
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4 Sheets-Sheet 4

Fig. 5.



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2,707,548

SPOOL FEEDING DEVICE

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Application March 8, 1952, Serial No. 275,607

Claims priority, application Germany March 10, 1951

15 Claims. (Cl. 198—65)

The present invention relates to a feeding device, and more particularly to a device for feeding spools to a winding machine.

It is the object of the present invention to provide an arrangement in which objects are supplied to a supply receiving device only if no such objects are already present in the supply receiving device.

It is another object of the present invention to interrupt supply of objects to a supply receiving device at predetermined intervals even if no objects are present in the supply receiving device.

With this object in view, the present invention mainly consists in a feeding device comprising supply carrying means; holding means combined with the supply carrying means and being movable between a holding position adapted to hold an object in the supply carrying means and a releasing position for releasing the object; supply receiving means co-operating with the supply carrying means and arranged for receiving an object released by the holding means from the supply carrying means; operating means for moving the holding means from the holding position into the releasing position; first operation control means combined with the operating means and including means for sensing objects in the supply receiving means, the first operation control means permitting movement of the holding means by the operating means only when there is no object sensed in the supply receiving means; second operation control means combined with the operating means and movable between a first position preventing movement of the holding means by said operating means and a second position permitting operation of the holding means by the operating means; and means for moving the second operation control means between the first and second positions.

It is a further object of the present invention to provide feeler means tending to engage objects in the supply receiving means, and causing supplying of an object to the supply receiving means when no object is present in the same.

It is a further object of the present invention to provide a plurality of cooperating supply carrying and supply receiving means, and to arrange actuating means for a simultaneous feeding of objects from each of said supply carrying means to the corresponding supply receiving means when no objects are present in the latter.

With these objects in view the present invention mainly consists in a feeding device having a plurality of supply carrying means mounted on a conveyor belt driven by rotary drums and passing over supply receiving stations. Each of the supply carrying means is provided with an outlet opening and has closure means closing the outlet opening and holding therein objects, such as empty spools, which are tending to drop through the outlet opening.

Actuating means are provided on the conveyor band and on the supporting means to provide an actuating impulse.

In order to prevent that each time a supply carrying

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means passes over a supply receiving means a spool is dropped, spring loaded feeler means are provided which engage objects contained in the supply receiving means and move to an operative position when no objects are present in the supply receiving means.

Motion transmitting means connect the feeler means—the actuating means, and the closure means so that the actuating means only open the closure means when the feeler means engage no object in the supply receiving means.

This result may be obtained by different constructions. According to a preferred embodiment the feeler means are directly connected to the closure means actuating the same when moving to operative position. Actuating means resiliently urge the feeler means into operative position, but as long as an object is present in the supply receiving means, the feeler means cannot perform such movement so that no object is released from the supply carrying means.

According to another preferred embodiment coupling means, which are controlled by the feeler means, are arranged between the actuating means and the closure means and controlled by the feeler means so that the closure means are only opened when coupled by the coupling means. The feeler means perform such coupling when they are in operative position which they assume when no object is present in the supply receiving means.

A modified embodiment of the present invention uses the feeler means directly for holding objects in the supply carrying means. According to this embodiment the feeler means have a holding portion engaging a projection on the object in the supply carrying means when the feeler means are in inoperative position, and an object is present in the supply receiving means. However, when no such object is present in the supply receiving means the feeler means are pivoted by a spring to an operative position and release the object in the supply carrying means so that the same may drop into the supply receiving means.

In this embodiment as well, closure means may be provided for closing the outlet of the supply carrying means.

In winding machines, for which the feeding device of the present invention is particularly advantageous, several spools are present in the supply receiving device and are shifted therein. The shifting arrangement, however, is not an object of the present invention. While such shifting takes place at predetermined intervals the supply carrying means may just pass over the supply receiving means and since the feeler means would not engage a spool in the supply receiving means during the shifting, a spool would be supplied from the supply carrying means although feeding is not required. It will be understood that feeding should only take place when there is no spool present in the supply receiving device and not when such spools are present, but momentarily being shifted within the supply receiving means.

In order to prevent such undesirable feeding of the spool while the spools are being shifted in the supply receiving means at predetermined intervals, a rotary cam member is provided which is operatively connected to a closure means in the above-described modified embodiment. At intervals determined by the cam member, the closure means remain closed and do not permit dropping of a spool which has been released by the feeler means. When feeding of spools is desired, the cam member permits an actuating lever, which is controlled by the cam member, to project into the path of the closure means so that the closure means are opened when the conveyor belt moves to a position in which the outlet opening of

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the supply carrying means, and the supply receiving means coincide.

In order to achieve the same result, that is, preventing of feeding at predetermined intervals even if the feeler means do not engage an object in the supply receiving means, the two first-mentioned embodiments are preferably provided with a similar arrangement. A cam follower sliding on a rotary cam member actuates in these two embodiments coupling means arranged between the actuating means and the closure member. According to the position of the cam member the actuating member is connected, or disconnected, respectively, to the other parts of the motion transmitting means so that at predetermined intervals the closure means is not open although the feeler means do not engage a spool in the supply receiving means.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawings, in which:

Fig. 1 is a side view of a preferred embodiment of the present invention;

Fig. 2 is a side view similar to Fig. 1 of a modified embodiment;

Fig. 3 is a front view of another preferred embodiment of the present invention;

Fig. 4 is a front view of a further modified embodiment of the present invention; and

Fig. 5 is a fragmentary front elevation of the embodiment shown in Fig. 2, with portions broken away for the sake of clarity.

Referring now to the drawings, and more particularly to Fig. 1 supporting means 1 and 2 support by means of a shaft 3 a rotary drum member 4 over which a conveyor belt 9 passes which is driven by the rotary drum 4. On the conveyor belt 9 supporting members 10 sliding on rails 19' are mounted spaced from each other and support supply carrying means 11 which are provided at the lower end thereof with an outlet opening closed by a closure means 13 to prevent dropping of an object 12, such as an empty spool, through the opening. The closure means is pivotally mounted on the supply carrying means 11 on pivoting pins 14 and may be pivoted to an object releasing position in which the outlet opening is free for the passing of a spool 12 due to gravity. A chute 8 is fixedly mounted below the supply carrying means on a bracket 7 of the supporting means 2 and guides objects dropping through the outlet opening in the supply carrying means 11 into the supply receiving means 36. An object 12' in the supply receiving means is prevented by stop means 37 from moving in axial direction. It will be understood that such dropping of objects through the chute 8 must only take place when the movable conveyor belt has transported the supply carrying means to a position above the chute 8.

In order to actuate the closure means 13 at the right moment, an actuating member 20 is mounted on each supporting member 10 and engages the actuating two-armed lever 21, 21' which is pivoted on the supporting means on the pivoting pin 5. Engagement of the arm 21 by the actuating member 20 causes movement of the other arm 21' of the actuating lever by which a coupling rod 22 is moved in an axial direction thereof. Coupling rod 22 is slidably mounted on the feeler means 19. A spring 33 is mounted on the coupling rod 22 abutting at one end thereof on the abutment member 31 which is fixedly secured to coupling rod 22, and on the other end thereof on the feeler means 19, so that when the coupling rod 22 is moved in axial direction by the actuating lever 21, 21' the feeler means 19 are resiliently urged in counter-clockwise direction (Fig. 1) to pivot about

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the shaft 35 mounted on the supporting means 34. Members 34, 35 and 19 constitute operation control means.

Such pivoting movement, however, can only take place if there is no object 12' present on the supply receiving means 36. In the event that there is an object 12' supported on the supply receiving member 36 it is not desirable that a further object 11 is supplied, and the feeler means 19 are prevented by the object 12' which abuts against the stop means 37 from movement to an operative position and must remain in the inoperative position shown in Fig. 1.

A further two-armed lever 17, 16 is pivotally mounted on shaft 6 on the supporting means 2 engaging with one end thereof the projection 15 on the closure means 13 and on the other end thereof a rod 18 which is pivotally secured to the feeler means 19.

The connection between the actuating lever 21, 21' and the feeler means 19 is interrupted at predetermined intervals by a cam member 28 which is rotatably mounted on the supporting means by means of a shaft 30, and is provided with a depressed portion 29 which causes the cam follower 27 to pivot about the shaft 26 whereby the other end 25 of the cam follower is moved to the position shown in Fig. 1. If, however, the cam follower passes over the remainder of the cam track on the cam member 28, the rod 24 is moved downwardly and the coupling rod 22 is pulled downwardly by the sleeve 23 secured to rod 24. Thereby the end of the coupling rod 22 is disengaged from the lever arm 21', the rod 22 pivoting about a support on the feeler means 19, so that the movement of the lever arm 21' cannot actuate the feeler means 19 to move to an operative position. Consequently the members 22, 24 constitute operation control-means.

The device operates as follows:

When during movement of the conveyor belt the projection 20 engages the actuating member 21, 21' the coupling rod 22 moves axially and the fixed abutment 31 thereon acts on spring 33 to resiliently press the feeler means 19 towards the supply receiving means. An object 12' on the supply receiving means prevents such movement. If, however, no object 12' is present on the supply receiving means, the feeler means 19 moves in a counterclockwise direction in Fig. 1. The rod 18 turns the two-armed lever 16, 17 in a clockwise direction so that the upper end thereof, engaging the projection 15 of the closure member 13, pivots the closure member to an object releasing position.

If during a switching of several members 12' which are supported by the supply receiving means 36 only momentarily no object 12' is present on the supply receiving means, it is desirable that no further object 12 is supplied to the supply receiving means. During such shifting of objects 12' on the supply receiving means 36 the cam 28 causes pivoting of rod 22 and disengagement thereof from said actuating lever 21, 21' so that no actuation of the closure member can take place. The modified embodiment shown in Figs. 2 and 5 corresponds to the embodiment shown in Fig. 1, however, instead of an actuating member 20 provided on each of the supporting members, a rotary actuating member 20' is arranged on the shaft 3 for common rotation with the drum 4. A plurality of feeding stations, each comprising a supply receiving means, a lever 16, 17, a feeler means 19 and a rod 18 are provided along the conveyor belt 9. The shaft 5 supporting the actuating lever 21, 21' extends along the stations and actuates the same by lever portions 21' through coupling rods 22 and springs 33.

Consequently all feeding stations are simultaneously actuated by the rotary actuating member 20'.

The advantage of this arrangement is that the conveyor belt need not transmit the forces required by the actuation of the lever 21, 21'.

The embodiment shown in Fig. 3 is provided with a

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conveyor belt 9 which is moved in a similar manner as in the previous embodiments. Supply carrying means 38 are secured to the conveyor belt and have an outlet opening at the bottom thereof which is closed by the closure means 14 which are pivotally mounted on the conveyor belt 9 by means of a pivoting pin 61. Below the supply carrying means 38 supply receiving means 46 is arranged, so that an object 12, such as a spool, may drop into the supply receiving means 46 when the conveyor belt transports the supply carrying means 38 through a position above the supply receiving means 46. A feeler means 64 is pivotally mounted by means of bracket 63 on the conveyor belt 9 and is urged by spring means 63' to engage an object 12' in the supply receiving means 46. An actuating lever 53 is pivotally mounted on the supply receiving means, or on the supporting means, respectively, and projects into the path of an actuating lever 54, 55 which is pivotally mounted at 56 on the conveyor belt 9. On the end of the arm 55 a coupling member 57 is pivotally mounted with one end thereof, while the other end of the coupling member is provided with an engaging portion 60 which engages the projecting arm 62 of the closure means 40. A link 59 pivotally connects the hook portion 65 of the feeler means 64 with the coupling member at 58 so that the coupling member is moved to the disengaging position shown in Fig. 3 when the feeler means 64 engage an object 12' in the supply receiving means 46. When, however, no object 12' is present in the supply receiving means 46 the spring 63' pivots the feeler means to an operative position so that the link 59 pulls the coupling member 57 to the left in Fig. 3 and the engaging portion 60 engages the projecting arm 62 of the closure means 40. When such engagement takes place, the lever 54, 55, when actuated by lever 53, pulls the coupling member and therewith the projecting portion 62 upwardly causing pivoting of the closure member 40 about the pivoting point 61 to an object releasing position permitting dropping of an object 12 into the supply receiving means.

In order to prevent feeding of objects 12 at predetermined intervals, even though there is no object 12' present in the supply receiving means 46, an arrangement is provided for pivoting the lever 53 to a position in which it does not project into the path of the lever arm 54 so that the closure means 40 are not actuated.

The pivoting of the lever 53 is carried out at predetermined intervals by cam 28 rotating about a shaft 30 and actuating a cam follower 27 pivotally mounted at 26. The rocking motion of the cam follower is transmitted by pivoted rods 51, 52 and a closing lever 50, pivoted at 58, to the actuating lever 53 so that engagement of the lever arm 54 with the actuating lever 53 cannot take place when the cam projection passes under the cam follower 27.

In this embodiment the supply receiving means is tubular so that the objects contained therein are prevented from dropping into the chute 8 by a closing member 49 which is pivoted at 58 and integral with the closing lever 50. While the spools are shifted in the winding machine, the cam member 28 keeps the closing member 49 in a position closing the bottom opening of the tubular supply receiving means 46. The arrangement is such that while the closing member 49 opens and permits a spool 12' to drop into the chute 8', the actuating lever is pivoted out of the path of the lever arm 54 and no further spool 12 can be supplied to the supply receiving means while the closing member 49 is in open position. Members 64, 63', 59, 60 and 62 constitute first operation control means, and member 53 constitutes a second operation control means.

A further modified embodiment is illustrated in Fig. 4 which again shows a conveyor belt 9 moving in the direction of the arrow 66 and supporting a supply carrying means 38 containing an object 12. Stationarily mounted below the supply carrying means is a tubular supply re-

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ceiving means 46 so that an object 12 may drop into the supply receiving means when the movement of the belt 9 brings the supply carrying means into alignment with the supply receiving means.

The objects 12 which are used in this arrangement are spools provided with a projecting flange. Such projecting flange is engaged by a holding means 45 which is connected by a rod 43 to the feeler means 44. Spring means 42' tend to turn the holding portion 45 and the feeler means 44 in one direction. In the event that there is a spool 12' present in the supplying receiving means 46 the feeler means 44 remain in inoperative position and the spool 12 is held in the supply carrying means by the holding means 45 engaging the flange on the spool 12. When, however, no spool is present in the supply receiving means 46 the feeler means 44 are pivoted to an operative position causing the holding means 45 to release the object 12 which drops into the supply receiving means.

In order to feed spools to the winding machine through the chute 8' at predetermined intervals, a cam member 28 rotating about shaft 30 is provided and pivots closing lever 50 about the pivoting point 48 by means of a rod 51 whereby closing member 49 on the opening at the bottom of the tubular supply receiving means 46 is opened. Simultaneously the connecting member 52 causes pivoting of the actuating lever 53.

In the above-described arrangement the spool 12 is held by the holding means 45 while the cam member has caused the opening of the closure means 40. When the closing member 49 is opened by members 50, 51, 27 and cam 28, the actuating member 53 is pivoted out of the path of the portion 41 of the closure means 40 so that the closure means 40 close the outlet opening of the supply carrying means, and no object 12 can drop into the supply receiving means while the closing member 49 is open and the object 12' has at least partly dropped out of the supply receiving means 46.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of feeding devices differing from the types described above.

While the invention has been illustrated and described as embodied in a device for feeding spools to a winding machine at predetermined intervals, and comprising feeler means for determining whether feeding is required, it is not intended to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can by applying current knowledge readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the following claims.

What is claimed as new and desired to be secured by Letters Patent is:

1. In a feeding device, in combination, supporting means; supply carrying means movably mounted on said supporting means and having an outlet opening, said supply carrying means being adapted to contain an object; closure means mounted on said supply carrying means movably between an object holding position for retaining an object, and an object releasing position permitting an object to drop through said outlet opening; supply receiving means arranged on said supporting means underneath said supply carrying means for receiving objects dropping through said outlet opening when said outlet opening passes over said supply receiving means during movement of said supply carrying means; movable feeler means pivotally mounted on said sup-

porting means and adapted to engage an object supported by said supply receiving means and being movable between an inoperative position adapted to abut against an object in said supply receiving means, and an operative position projecting into the space for receiving an object in said supply receiving means; an actuating lever pivotally mounted on said supporting means; an actuating member mounted on said movable supply carrying means and engaging said first actuating member during movement of said supply carrying means when said outlet opening passes over said supply receiving means; a two-armed lever pivotally mounted on said supporting means and engaging with one end thereof said closure means; a rod connecting the other end of said two-armed lever with said feeler means so that said closure means are pivoted to said object releasing position thereof when said feeler means move to said operative position thereof; and resilient means engaging at one end thereof said actuating lever and at the other end thereof said feeler means so that said feeler means are resiliently urged into said operative position thereof when said actuating lever is engaged by said actuating member.

2. In a feeding device, in combination, supporting means; supply carrying means movably mounted on said supporting means and having an outlet opening, said supply carrying means being adapted to contain an object; closure means pivotally mounted on said supply carrying means movably between an object holding position for retaining an object, and an object releasing position permitting an object to drop through said outlet opening; supply receiving means arranged on said supporting means underneath said supply carrying means for receiving objects dropping through said outlet opening when said outlet opening passes over said supply receiving means during movement of said supply carrying means; a chute member mounted on said supporting means and extending from said outlet opening towards said supply receiving means for guiding an object dropping through said outlet opening towards said supply receiving means; movable feeler means pivotally mounted on said supporting means and adapted to engage an object supported by said supply receiving means and being movable between an inoperative position adapted to abut against an object in said supply receiving means, and an operative position projecting into the space for receiving an object in said supply receiving means; an actuating lever pivotally mounted on said supporting means; an actuating member mounted on said movable supply carrying means and engaging said first actuating member during movement of said supply carrying means when said outlet opening passes over said supply receiving means; a two-armed lever pivotally mounted on said supporting means and engaging with one end thereof said closure means; a rod connecting the other end of said two-armed lever with said feeler means so that said closure means are pivoted to said object releasing position thereof when said feeler means move to said operative position thereof; a coupling rod slidingly mounted on said feeler means and engaging with one end thereof said actuating lever; an abutment on said coupling rod located between said feeler means and said actuating member; and a spring mounted on said rod and engaging at one end thereof said abutment and at the other end thereof said feeler means, so that said feeler means are resiliently urged into said operative position thereof when said actuating lever is engaged by said actuating member.

3. In a feeding device, in combination, supporting means; supply carrying means movably mounted on said supporting means and having an outlet opening, said supply carrying means being adapted to contain an object; closure means pivotally mounted on said supply carrying means movably between an object holding position for retaining an object, and an object releasing position permitting an object to drop through said outlet opening; supply receiving means arranged on said

supporting means underneath said supply carrying means for receiving objects dropping through said outlet opening when said outlet opening passes over said supply receiving means during movement of said supply carrying means; movable feeler means pivotally mounted on said supporting means and adapted to engage an object supported by said supply receiving means and being movable between an inoperative position adapted to abut against an object in said supply receiving means, and an operative position projecting into the space for receiving an object in said supply receiving means; an actuating lever pivotally mounted on said supporting means; an actuating member mounted on said movable supply carrying means and engaging said first actuating member during movement of said supply carrying means when said outlet opening passes over said supply receiving means; a two-armed lever pivotally mounted on said supporting means and engaging with one end thereof said closure means; a rod connecting the other end of said two-armed lever with said feeler means so that said closure means are pivoted to said object releasing position thereof when said feeler means move to said operative position thereof; a coupling rod slidingly mounted on said feeler means and engaging with one end thereof said actuating lever; an abutment on said coupling rod located between said feeler means and said actuating member; a spring mounted on said rod and engaging at one end thereof said abutment and at the other end thereof said feeler means, so that said feeler means are resiliently urged into said operative position thereof when said actuating lever is engaged by said actuating member; a cam member rotatably mounted on said supporting means; a follower member pivotally mounted on said supporting means and engaging with one end thereof said cam member; and link means connecting said follower member with said coupling rod, said cam member being shaped in such manner that at predetermined intervals said coupling rod is disengaged from said actuating lever so as to prevent movement of said feeler means to said operative position thereof whenever desired.

4. In a feeding device, in combination, supporting means; supply carrying means movably mounted on said supporting means and having an outlet opening, said supply carrying means being adapted to contain an object; closure means pivotally mounted on said conveyor belt means movably between an object holding position for retaining an object, and an object releasing position permitting an object to drop through said outlet opening; supply receiving means arranged on said supporting means underneath said supply carrying means for receiving objects dropping through said outlet opening when said outlet opening passes over said supply receiving means during movement of said supply carrying means; movable feeler means adapted to engage an object supported by said supply receiving means and being movable between an inoperative position adapted to abut against an object in said supply receiving means, and an operative position projecting into the space for receiving an object in said supply receiving means; resilient means urging said feeler means into said operative position; an actuating member mounted on said supporting means; a two-armed lever mounted pivotally on said conveyor belt and engaging with one end thereof said actuating member when said outlet opening passes over said supply receiving means; a coupling member pivotally mounted at the other end of said two-armed lever movably between a coupling position engaging said closure means and a releasing position releasing said closure means; and a link member connecting said feeler means with said coupling member so that the latter moves to said disengaged position when said feeler means moves to said inoperative position, and so that said coupling member moves to said coupling position when said feeler means are urged by said resilient means to said operative position whereby said closure means are only moved to

said object releasing position when no object is supported by said supply receiving means.

5. In a feeding device, in combination, supporting means; supply carrying means movably mounted on said supporting means and having an outlet opening, said supply carrying means being adapted to contain an object; closure means pivotally mounted on said supply carrying means movably between an object holding position for retaining an object, and an object releasing position permitting an object to drop through said outlet opening; supply receiving means arranged on said supporting means underneath said supply carrying means for receiving objects dropping through said outlet opening when said outlet opening passes over said supply receiving means during movement of said supply carrying means; movable feeler means pivotally mounted on said supply carrying means and adapted to engage an object supported by said supply receiving means and being movable between an inoperative position adapted to abut against an object in said supply receiving means, and an operative position projecting into the space for receiving an object in said supply receiving means; resilient means urging said feeler means into said operative position; an actuating lever pivotally mounted on said supporting means; a two-armed lever mounted pivotally on said supply carrying means and engaging with one end thereof said actuating lever when said outlet opening passes over said supply receiving means; a coupling at the other end of said two-armed lever movably between a coupling position engaging said closure means and a disengaged position releasing said closure means; a link member connecting said feeler means with said coupling member so that the latter moves to disengaged position when said feeler means moves to said inoperative position, and so that said coupling member moves to said coupling position when said feeler means are urged by said resilient means to said operative position whereby said closure means are only moved to said object releasing position when no object is supported by said supply receiving means; a cam member rotatably mounted on said supporting means; a follower member pivotally mounted on said supporting means and sliding with one end thereof on said cam member; and link means connecting said follower member with said actuating lever, said cam member being shaped in such manner that said actuating lever is pivoted out of the path of said two-armed lever so as to prevent movement of said closure means to said object releasing position at predetermined desired intervals regardless of the position of said feeler means.

6. In a feeding device, in combination, supporting means; at least one rotary drum member mounted on said supporting means; a conveyor belt passing over said drum member; a plurality of supply carrying means secured to said conveyor belt, each of said supply carrying means having an outlet opening, each of said supply carrying means adapted to contain an object; closure means pivotally mounted on said supply carrying means movably between an object holding position for retaining an object, and an object releasing position permitting an object to drop through said outlet opening; a plurality of supply receiving means each arranged on said supporting means underneath said supply carrying means for receiving objects dropping through said outlet opening when said outlet opening passes over said supply carrying means; a plurality of movable feeler means pivotally mounted on said supporting means and adapted to engage an object supported by said supply receiving means and being movable between an inoperative position adapted to abut against an object in said supply receiving means, and an operative position projecting into the space for receiving an object in said supply receiving means; an actuating rotary member rotatably mounted on said supporting means; means connecting said actuating rotary member with said rotary drum member for common rotation; at least one actuating projection

on said actuating rotary member; a shaft rotatably mounted on said supporting means extending in the direction of said conveyor belt; an actuating lever fixedly mounted on said shaft and engaging with one end thereof said projection on said rotary actuating member during rotation thereof; a plurality of actuating lever members fixedly mounted on said shaft, one actuating lever member for each supply receiving means; a plurality of two-armed levers pivotally mounted on said supporting means, one for each supply receiving means, each engaging with one end thereof one of said closure means during movement of said supply carrying means; connecting rods connecting the other end of each of said two-armed levers with one of said feeler means; a plurality of coupling rods engaging at one end thereof one of said actuating lever members and at the other end thereof being each slidably mounted on one of said feeler means; abutments on each of said coupling rods located spaced from said ends of said coupling rods; and spring means mounted on each of said coupling rods and engaging at one end thereof said abutment and at the other end thereof said feeler means.

7. In a feeding device, in combination, supporting means; supply carrying means movably mounted on said supporting means and having an outlet opening, said supply carrying means being adapted to contain an object; closure means pivotally mounted on said conveyor belt means movably between an object holding position for retaining an object, and an object releasing position permitting an object to drop through said outlet opening; supply receiving means arranged on said supporting means underneath said supply carrying means for receiving objects dropping through said outlet opening when said outlet opening passes over said supply receiving means during movement of said supply carrying means and having a bottom opening; movable feeler means pivotally mounted on said supply carrying means and adapted to engage an object supported by said supply receiving means and being movable between an inoperative position adapted to abut against an object in said supply receiving means, and an operative position projecting into the space for receiving an object in said supply receiving means; resilient means urging said feeler means into said operative position; an actuating lever pivotally mounted on said supporting means; a two-armed lever mounted pivotally on said conveyor belt and engaging with one end thereof said actuating lever when said outlet opening passes over said supply receiving means; a coupling at the other end of said two-armed lever movably between a coupling position engaging said closure means and a disengaged position releasing said closure means; a link member connecting said feeler means with said coupling member so that the latter move to disengaged position when said feeler means move to said inoperative position, and so that said coupling member moves to said coupling position when said feeler means are urged by said resilient means to said operative position whereby said closure means are only moved to said object releasing position when no object is supported by said supply receiving means; a cam member rotatably mounted on said supporting means; a follower member pivotally mounted on said supporting means and sliding with one end thereof on said cam member; a closing member pivotally mounted on said supply receiving means movably between a closing position closing said bottom opening therein and an open position; a projecting member fixedly secured to said closing member; and link means connecting said follower member with said actuating lever and with said cam follower, said cam member being shaped in such manner that said actuating lever is pivoted out of the path of said two-armed lever so as to prevent movement of said closure means to said object releasing position at predetermined intervals whenever desired even though said feeler means are in

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said operative position thereof and said closing means are moved to said open position thereof.

8. In a feeding device, in combination, supporting means; at least one rotary drum member mounted on said supporting means; a conveyer belt passing over said drum member; a plurality of supply carrying means secured to said conveyer belt, each of said supply carrying means having an outlet opening, each of said supply carrying means adapted to contain an object; closure means pivotally mounted on said supply carrying means movably between an object holding position for retaining an object, and an object releasing position permitting an object to drop through said outlet opening; a plurality of supply receiving means each arranged on said supporting means underneath said supply carrying means for receiving objects dropping through said outlet opening when said outlet opening passes over said supply carrying means; a plurality of movable feeler means pivotally mounted on said supporting means and adapted to engage an object supported by said supply receiving means and being movable between an inoperative position adapted to abut against an object in said supply receiving means, and an operative position projecting into the space for receiving an object in said supply receiving means; an actuating rotary member rotatably mounted on said supporting means; means connecting said actuating rotary member with said rotary drum member for common rotation; at least one actuating projection on said actuating rotary member; a shaft rotatably mounted on said supporting means extending in the direction of said conveyer belt; an actuating lever fixedly mounted on said shaft and engaging with one end thereof said projection on said rotary actuating member during rotation thereof; a plurality of actuating lever members fixedly mounted on said shaft, one actuating lever member for each supply receiving means; a plurality of two-armed levers pivotally mounted on said supporting means, one for each supply receiving means, each engaging with one end thereof one of said closure means during movement of said supply carrying means; connecting rods connecting the other end of each of said two-armed levers with one of said feeler means; a plurality of coupling rods engaging at one end thereof one of said actuating lever members and at the other end thereof being each slidably mounted on one of said feeler means; abutments on each of said coupling rods located spaced from said ends of said coupling rods; spring means mounted on each of said coupling rods and engaging at one end thereof said abutment and at the other end thereof said feeler means; a plurality of cam members rotatably mounted on said supporting means; a plurality of follower members pivotally mounted on said supporting means, and each engaging with one end thereof one of said cam members; and link means connecting said follower members with said coupling rods, said cam members being shaped in such manner that at predetermined intervals said coupling rods are disengaged from said actuating lever so as to prevent movement of said feeler means to said operative position thereof whenever desired.

9. In a feeding device, in combination, supply carrying means; holding means cooperating with said supply carrying means, said holding means being movable between a holding position and a releasing position, and in said holding position adapted to hold an object in said supply carrying means and in said releasing position adapted to release said object; supply receiving means cooperating with said supply carrying means and arranged for receiving an object released by said holding means; first operation control means including feeler means adapted to sense and indicate an object in said supply receiving means; operating means controlled by said feeler means for moving said holding means from said holding position into said releasing position when said feeler means indicate the absence of an object in said supply receiving means, said operating means including second operation-

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control means connected to said feeler means, said second operation-control means being movable between a coupling position and a disconnecting position, said operating means being only effective when said second operation-control means are in said coupling position; and means for moving at predetermined moments said second operation-control means from said coupling position into said disconnecting position of the same for preventing undesired release of an object by said holding means even if no object is present in said supply receiving means.

10. In a feeding device, in combination, supply carrying means; holding means cooperating with said supply carrying means, said holding means being movable between a holding position and a releasing position, and in said holding position adapted to hold an object in said supply carrying means and in said releasing position adapted to release said object; supply receiving means cooperating with said supply carrying means and arranged for receiving an object released by said holding means; operation control means including feeler means adapted to engage an object in said supply receiving means and being movable between an inoperative position adapted to abut against an object in said supply receiving means and an operative position projecting into the space for receiving an object in said supply receiving means; operating means for moving said holding means from said holding position into said releasing position when said feeler means are in said operative position of the same, said operating means including coupling means connected to said feeler means, said coupling means being movable between a coupling position and a disconnecting position, said operating means being only effective when said coupling means are in said coupling position; and means for moving at predetermined moments said coupling means from said coupling position into said disconnecting position of the same for preventing undesired release of an object by said holding means regardless of the position of said feeler means.

11. In a feeding device, in combination, supporting means; supply carrying means movably mounted on said supporting means and having an outlet opening, said supply carrying means being adapted to contain an object; closure means mounted on said supply carrying means movably between an object holding position for retaining an object, and an object releasing position permitting an object to drop through said outlet opening; supply receiving means arranged on said supporting means underneath said supply carrying means for receiving objects dropping through said outlet opening when said outlet opening passes over said supply receiving means during movement of said supply carrying means; movable feeler means adapted to engage an object supported by said supply receiving means and being movable between an inoperative position adapted to abut against an object in said supply receiving means, and an operative position projecting into the space for receiving an object in said supply receiving means; a first actuating member mounted on said supporting means; a second actuating member mounted on said movable supply carrying means and engaging said first actuating member during movement of said supply carrying means when said outlet opening passes over said supply receiving means; motion transmitting means operatively connecting said feeler means, said closure means and one of said actuating members so that said one of said actuating members, when engaged by the other of said actuating members, causes movement of said closure means to said object releasing position only when said feeler means are in said operative position, said motion transmitting means including coupling means movable between a coupling position and a disconnecting position, said motion transmitting means being only effective when said coupling means are in said coupling position; and means for moving said coupling means from said coupling position into

said disconnecting position whenever desired regardless of the position of said feeler means.

12. In a feeding device, in combination, supporting means; supply carrying means movably mounted on said supporting means and having an outlet opening, said supply carrying means being adapted to contain an object; closure means pivotally mounted on said supply carrying means movably between an object holding position for retaining an object, and an object releasing position permitting an object to drop through said outlet opening; supply receiving means arranged on said supporting means underneath said supply carrying means for receiving objects dropping through said outlet opening when said outlet opening passes over said supply receiving means during movement of said supply carrying means; movable feeler means pivotally mounted on said supply carrying means and adapted to engage an object supported by said supply receiving means and being movable between an inoperative position adapted to abut against an object in said supply receiving means, and an operative position projecting into the space for receiving an object in said supply receiving means; resilient means urging said feeler means into said operative position; an actuating lever pivotally mounted on said supporting means; a two-armed lever mounted pivotally on said supply carrying means and engaging with one end thereof said actuating lever when said outlet opening passes over said supply receiving means; a coupling at the other end of said two-armed lever movably between a coupling position engaging said closure means and a disengaged position releasing said closure means; a link member connecting said feeler means with said coupling member so that the latter move to disengaged position when said feeler means move to said inoperative position, and so that said coupling member moves to said coupling position when said feeler means are urged by said resilient means to said operative position whereby said closure means are only moved to said object releasing position when no object is supported by said supply receiving means; and means including a cam member for pivoting said actuating lever out of the path of said two-armed lever so as to prevent at predetermined times movement of said closure means to said object releasing position.

13. In a feeding device, in combination, supply carrying means; holding means combined with said supply carrying means and being movable between a holding position adapted to hold an object in said supply carrying means and a releasing position for releasing said object; supply receiving means co-operating with said supply carrying means and arranged for receiving an object released by said holding means from said supply carrying means; operating means for moving said holding means from said holding position into said releasing position; first operation control means combined with said operating means and including means for sensing objects in said supply receiving means, said first operation control means permitting movement of said holding means by said operating means only when there is no object sensed in said supply receiving means; second operation control means combined with said operating means and movable between a first position preventing movement of said holding means by said operat-

ing means and a second position permitting operation of said holding means by said operating means; and means for moving said second operation control means between said first and second positions.

14. In a feeding device, in combination, supply carrying means; holding means combined with said supply carrying means and being movable between a holding position adapted to hold an object in said supply carrying means and a releasing position for releasing said object; supply receiving means co-operating with said supply carrying means and arranged for receiving an object released by said holding means from said supply carrying means; operating means for moving said holding means from said holding position into said releasing position; first operation control means combined with said operating means permitting movement of said holding means by said operating means only when there is no object in said supply receiving means; second operation control means combined with said operating means and movable between a first position preventing movement of said holding means by said operating means and a second position permitting operation of said holding means by said operating means; removing means for removing an object from said supply receiving means; and combined actuating means for simultaneously operating said removing means and for moving said second operation control means from said second position to said first position of the same and back, so that said second operation control means is in the first position thereof when said removing means are operated.

15. In a feeding device in combination, supply carrying means; first holding means combined with said supply carrying means, said first holding means being movable between a holding position adapted to hold an object in said supply carrying means and a releasing position for releasing said object; supply receiving means cooperating with said supply carrying means and arranged for receiving an object released by said first holding means from said supply carrying means; operating means for moving said first holding means from said holding position into said releasing position when there is no object in said supply receiving means, said operating means including coupling means movable between a disconnected position preventing movement of said first holding means by said operating means and a coupling position permitting operation of said first holding means by said operating means; second holding means combined with said supply receiving means, said second holding means being movable between a holding position adapted to hold an object in said supply receiving means and a releasing position for releasing said object; and actuating means movable between a first position placing said second holding means in holding position and holding said coupling means in coupling position and a second position simultaneously positioning said second holding means in said releasing position and holding said coupling means in disconnected position.

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