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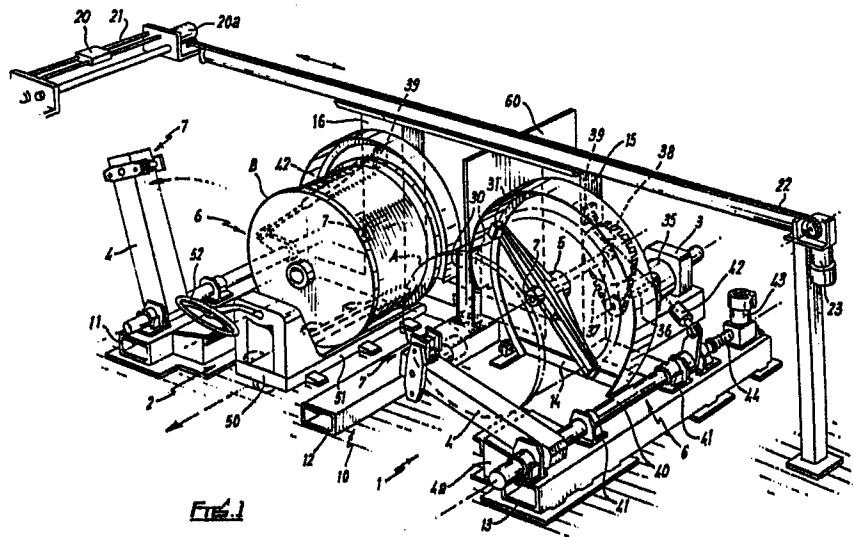
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(54) **Apparatus for reeling.**

(57) A continuously operable reeling machine comprises two reeling stations (1 and 2). Whilst reeling proceeds at one station (1), a full reel (B) may be removed from the other (2) and replaced by an empty reel to which the element being reeled is eventually transferred when the reel (A) at the first mentioned station (1) is full. Removal and replacement of that full reel is then undertaken whilst reeling proceeds at the other station. Each reel is supported in its reeling position by a pair of supports (4, 5). One of those supports 4 may be pivoted from its operative, reeling, position to an inoperative position which permits withdrawal and replacement of the reel in the axial direction of the reel. During withdrawal and replacement reels (A, B) are supported on trolleys (50) which may be wheeled up to and away from the reeling stations. This arrangement is simple to operate and efficient in its use of floor space.



-1-

APPARATUS FOR REELING

The present invention relates to apparatus for reeling an elongate flexible element on a reel or bobbin. The invention is particularly,
5 but not exclusively, intended for such elements when in the form of wire or cable.

So that reeling may proceed in a continuous manner, it is, at the present time, the common practice to have two reels disposed side by side with their axes
10 spaced but parallel. The element being reeled is fed, usually through a traversing device reciprocating parallel to the axes of the reels, to one reel, and, when that reel is full the element is transferred to the second reel, which is empty at
15 that stage, and is severed to detach it from the wound element on the first reel. Reeling proceeds as before, but this time on the second reel. The full reel may then be removed and replaced by an empty reel. When the second reel is full, the
20 element is transferred back to the now empty reel alongside and the second full reel replaced by an empty reel as in the case of the first reel and so on. Logic, efficient use of space and preferred

-2-

production and processing techniques dictate that full reels should all be removed from the apparatus in the same direction and that empty reels should be supplied to the apparatus from the same direction. If the two reels are placed alongside each other with their axes parallel, they can only be removed, when full, in opposite directions, if they are to be moved at right angles to their axial direction out of the apparatus. To avoid this problem, the reels may be removed laterally, but this of course involves displacing the reels bodily in their non-rolling direction. In one such known method of reel removal based on lateral displacement, one of the reels is supported on supports during reeling which may be translated laterally together with the reel they support and, when so translated, may then be removed in the same direction (although laterally displaced from it) as the other reel. Such an arrangement is unnecessarily complicated and occupies additional shop floor space laterally of the normal reeling position of the reel.

According to the present invention, there is provided apparatus for reeling an elongate flexible element comprising first and second reeling stations,

-3-

drive means for driving reels in position at the stations, support means at each station for supporting a reel at that station during reeling, each said support means comprising a pair of
5 supports operative to support a reel at the corresponding station and one of the supports being movable between that operative support position and a second, inoperative, position which permits the reel to be withdrawn in the axial direction.

10 A preferred embodiment of the invention may include any one or more of the following advantageous features:-

- (a) Each movable support comprises a movable arm,
- 15 (b) Each support comprises a pintel adapted for insertion in a corresponding aperture in a reel to be supported,
- (c) The pintel is disposed at that end of the movable arm adjacent the reel in the first
20 operative position of the support,

-4-

- (d) Each movable arm is pivotable between
the first and second positions,
- (e) Each pivotable arm is mounted on a
rotatably mounted shaft and means are
5 provided for rotating the shaft to
rotate the arm,
- (f) The means for rotating comprise a piston
and cylinder device adapted to receive
pressure fluid from a pressure fluid source,
- 10 (g) The means for rotating comprises a mechan-
ical means for example a motor driven
screw mechanism.
- (h) Means are provided for locking each arm
in one or other of the two positions,
- 15 (i) Each locking means comprises a mechanical
device,
- (j) Means are provided for driving the reels
through the non-movable supports,
- (k) The means for driving of (j) comprises an
20 electric motor driving gearing via a belt,

-5-

- 5 (l) Each station is constructed to permit
a trolley to be inserted underneath
the corresponding reel when in the
normal reeling position,
- 10 (m) The trolley comprises a platform having
two forks which may be inserted beneath
the reel and then raised to support
the reel so that the reel supports may
be withdrawn.

In order that the invention may be more clearly understood, one embodiment thereof will now be described, by way of example, with reference to the accompanying drawing, in which:-

15 Figure 1 shows a perspective diagrammatic view of one form of reeling machine, and

Figures 2a to 2d diagrammatically show sequential steps in the removal and exchange of a reel on the apparatus of Figure 1.

-6-

Referring to Figure 1, the apparatus comprises first and second reeling stations indicated generally by the reference numerals 1 and 2. Each reeling station basically comprises a reel drive 3 (station 1 drive 3 only shown) a pair of reel supports 4 and 5 and a mechanism 6 for moving one of the supports 4 between first and second positions. Equivalent parts of the two stations have been designated by the same reference numerals on the drawings. Each reel support 4, 5 comprises a pintel 7 at its free end for insertion in the axially located aperture 8 in the reel to engage the reel. The reels at stations 1 and 2 have been referenced A and B respectively and have been drawn in outline only to simplify the drawing. The reeling stations are disposed on a base indicated generally by the reference numeral 10 and comprising transverse members 11, 12 and 13 and longitudinal members (only one, referenced 14, is shown). At one side of the frame are disposed two upright members 15 and 16 which respectively support the supports 5. Above the reeling stations is disposed a traversing mechanism for wire being fed to the apparatus for reeling. This mechanism comprises a reciprocable carrier 20 mounted on traversing guides and screw

-7-

21 which are rotatable by means of an electric motor
20a. This carrier may be moved longitudinally by
means of a chain and sprocket drive 22 driven by
means of an electric motor and gearbox 23. During
5 reeling the normal operating position of carrier 20
is above the two reels and at that end of the drive
22 remote from the motor 23. When wire changeover is
required, the carrier is driven longitudinally by
drive 22 to the other end of the drive. After wire
10 changeover and prior to full reel removal front guard
doors, (not shown) are opened. A sliding centre guard
60 then moves forwards to isolate the winding reel
from the operator whilst he is withdrawing the stopped
full reel from the machine, as will be described in
15 more detail later.

A conventional wire change device for cutting
and switching wire being reeled from one reel to
another when the first reel is full is provided.
This comprises wire deflectors 30 disposed between
20 the two reels A and B and a rotating wire snagger
(gripper) 31 connected to one of the supports 5
of station 1, which is operative to sever the
wire as well as transfer it from reel to reel.

Each drive 3 comprises an electric motor 35, the
25 output drive shaft 36 which is drivably connected
by means of a belt 37 to a drive wheel 38 which is
in turn drivably connected to the support 5 whereby
the reel A may be rotated through the corresponding
pintel 7. Each mechanism 6 comprises a rotatable
30 shaft 40 mounted in bearings' 41 supported on a trans-

-8-

verse member 13. An articulated linkage is pivotally connected between a fixing point 39 on upright 15 and shaft 40. This linkage comprises a piston and cylinder device 42, either hydraulic or pneumatic, which may be fed from a source of pressure fluid (not shown) to extend and contract the piston so as to rotate the shaft 40 corresponding to either the first or second position of the mechanism 6, 7 and 4. Axial adjustment of the shaft 40 is effected by means of an electric motor 43 disposed at one end of the member 13 and drivably connected to the shaft 40 by means of gearing 44. This axial adjustment of shaft 40 permits different width reels to be readily accommodated. All pintels 7 are axially extendable and retractable in the conventional manner, but it should be noted that this is not necessary in view of the adjustability of shafts 40. Connected at the opposite end of shaft 40 is the corresponding reel support 4 which is connected at its free end to the associated pintel 7. When the shaft 40 is rotated, the support 4 pivots between the first and second positions.

The arm 4 of station 1 is shown in the first, operative, position in which the reel A is supported by the pintels 7 in the reeling position. In this

-9-

position a mechanical lock or clamp 4a connects the arm 4 to the base member 13 and prevents movement of the arm. The arm 4 of station 2 is shown in the second, inoperative, position in which the
5 reel B is not supported by the pintels but by a trolley 50 which can be wheeled out to withdraw the reel in an axial direction. Trolley 50 comprises a two armed platform 51 which can be jacked up and down manually by means of a handle 52. The arm 4,
10 in the second inoperative position, is pivoted out of the way so that it does not impede the axial withdrawal of reel B.

The steps of reel withdrawal will now be described more fully with reference to Figures 2a to
15 2d. The normal reeling position with wire W being fed to reel B via traverse 20 and reeled thereon by rotation of reel B is shown in Figure 2a. Reel A is empty. When reel B is full the wire W is transferred to reel A by the conventional transfer mechanism 20 already briefly described but not shown
20 in Figure 2a. Trolley 50 is wheeled beneath reel B and platform 51 jacked up by pumping the handle 52. This relieves the pressure on the pintels 7 due to the weight of the reel B enabling the pintels
25 7 to be withdrawn from the corresponding apertures

-10-

in the reel B. With the pintel 7 on the arm 4 withdrawn, the arm 4 can be pivoted from its first, operative, position to a second, inoperative, position. The position is then as shown in Figure 2b. With arm 4 pivoted out of the way of the reel B, the reel can be withdrawn from the reeling apparatus (see Figure 2c) in the axial direction of the reel and can be moved in any direction, (for example in one of the three directions shown), away from the apparatus by appropriately manipulating the trolley 50 and over any distance within the shop floor area. Indeed, the trolleys 50 are relatively so inexpensive that full reels may be stored on the trolleys for easy removal when desired. In a similar manner to reel removal a new, empty reel B can be brought from any direction (see Figure 2d) and installed in station 2 by reversing the procedure for reel removal. Thus the new reel B is wheeled into station B on a trolley 50, arm 4 is pivoted from its second, inoperative, position to its first, operative, position and the pintels 7 are then inserted into the apertures in the reel B to support the reel B thus allowing the platform 52 of the trolley 50 to be lowered and the trolley 50 withdrawn. When reel A is full, the wire W is transferred by the transfer mechanism to empty

-11-

reel B and full reel A may then be removed and replaced by an empty reel A in the same way described above for reel B.

It will be appreciated that the space taken
5 up permanently on the shop floor by the above described apparatus is limited to that occupied by the two reeling stations themselves. Although space must be provided to permit axial withdrawal of the reels from the apparatus, this space is required
10 only at withdrawal times. It will also be appreciated that reels be removed from the apparatus after withdrawal in a wide variety of directions and that reels from both stations may, if desired, all be removed in one given direction and all supplied in
15 one given direction. Such a facility may considerably simplify operation of the apparatus. Providing for the use of a trolley also has distinct advantages facilitating manipulation of both full and empty reels around the shop floor.

20 It will also be appreciated that the above embodiment has been described by way of example only and that many variations are possible without departing from the scope of the invention. For

-12-

example, although a manually operable trolley lift has been described, power operated lifts may equally well be employed.

-13-

CLAIMS

1. Apparatus for reeling an elongate flexible element comprising first and second reeling stations (1 and 2) drive means (3) for driving
5 reels (A and B) in position at the stations, and support means (4, 5) at each station for supporting a reel (A, B) at that station during reeling, characterised in that each said support means comprises a pair of supports (4, 5) operative to
10 support a reel (A, B) at the corresponding station (1, 2) and one of the supports (4) is movable between that operative support position and a second inoperative, position which permits the reel (A, B) to be withdrawn in the axial direction.
- 15 2. Apparatus as claimed in Claim 1, in which each movable support (4) comprises a movable arm.
3. Apparatus as claimed in claim 2, in which each support (4) comprises a pintel (7) adapted for insertion in a corresponding aperture (8) in a reel
20 to be supported.
4. Apparatus as claimed in Claim 3, in which the

-14-

pintel (7) is disposed at that end of the movable arm (4) adjacent the reel in the first operative position of the support.

5 5. Apparatus as claimed in Claim 2 or 3, in which each movable arm (4) is pivotable between the first and second positions.

6. Apparatus as claimed in Claim 5, in which each povitable arm (4) is mounted on a rotatably mounted shaft (40) and means (42) are provided for rotating the shaft (40) to rotate the arm (4).

10 7. Apparatus as claimed in Claim 6, in which the means for rotating comprises a piston and cylinder device (42) adapted to receive pressure fluid from a pressure fluid source.

15 8. Apparatus as claimed in Claim 6, in which the means for rotating comprise a mechanical means for example a motor driven screw mechanism.

9. Apparatus as claimed in any of claims 2 to 8, in which means (4a) are provided for locking each arm (4) in one or other of the two positions.

20 10. Apparatus as claimed in Claim 9, in which each locking means comprises a mechanical device.

-15-

11. Apparatus as claimed in any preceding claim,
in which means (3) are provided for driving the reels
through the non-movable supports.

12. Apparatus as claimed in claim 11, in which the
5 means for driving (3) comprise an electric motor
(35) driving gearing via a belt (37).

13. Apparatus as claimed in any preceding claim,
in which each station (1, 2) is constructed to permit
a trolley (50) to be inserted underneath the corres-
10 ponding reel (A, B) when in the normal reeling posi-
tion.

14. Apparatus as claimed in claim 13, in which
the trolley (50) comprises a platform (51) having
two forks which may be inserted beneath the reel
15 (A, B) and then raised to support the reel so that
the reel supports (4, 5) may be withdrawn.

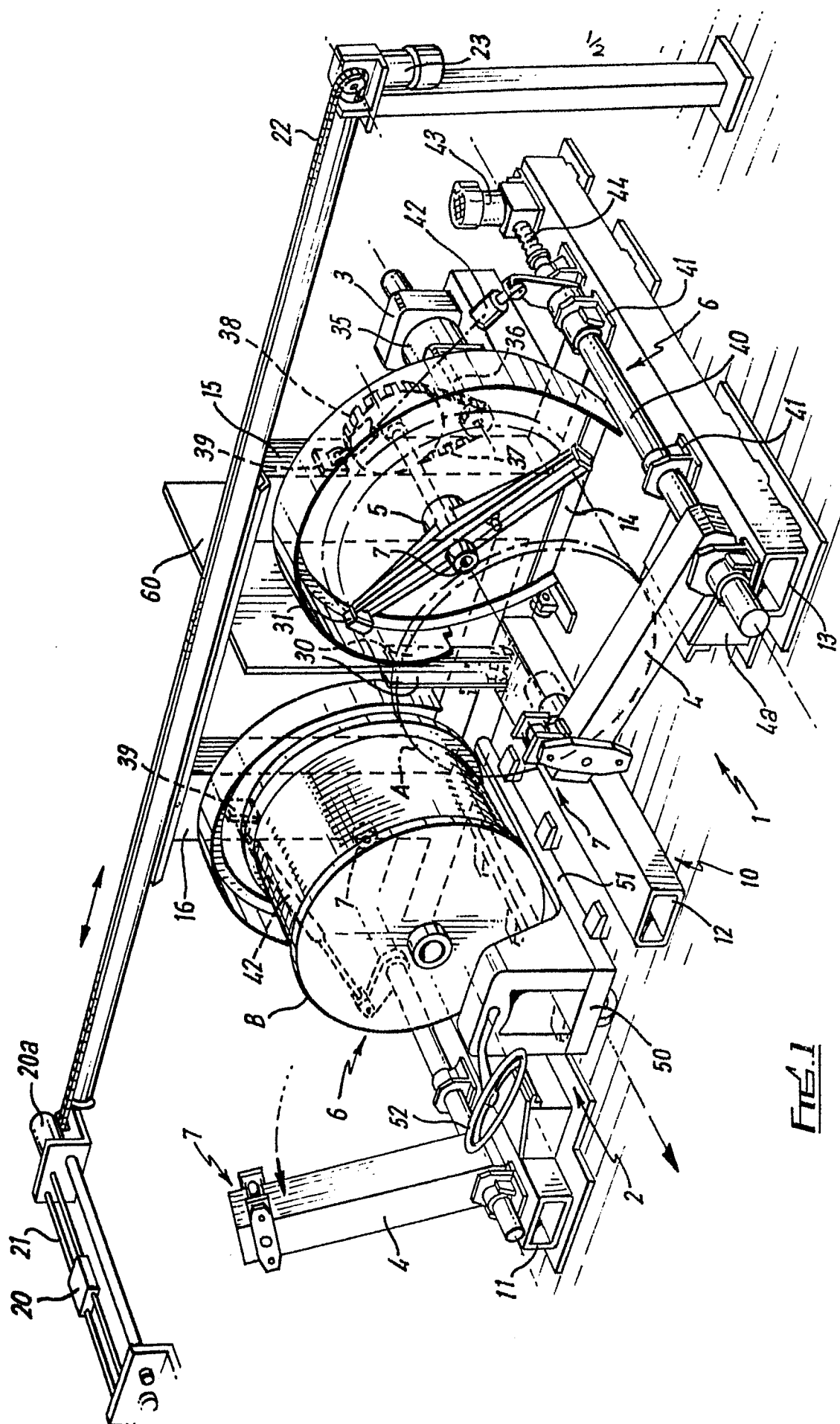


FIG. 1

