Oct. 28, 1969 K. W. KLOSE 3,474,978

DUAL SUPPLY ROLL HANDLING MECHANISM

Filed Jan. 24, 1968 5 Sheets-Sheet 1

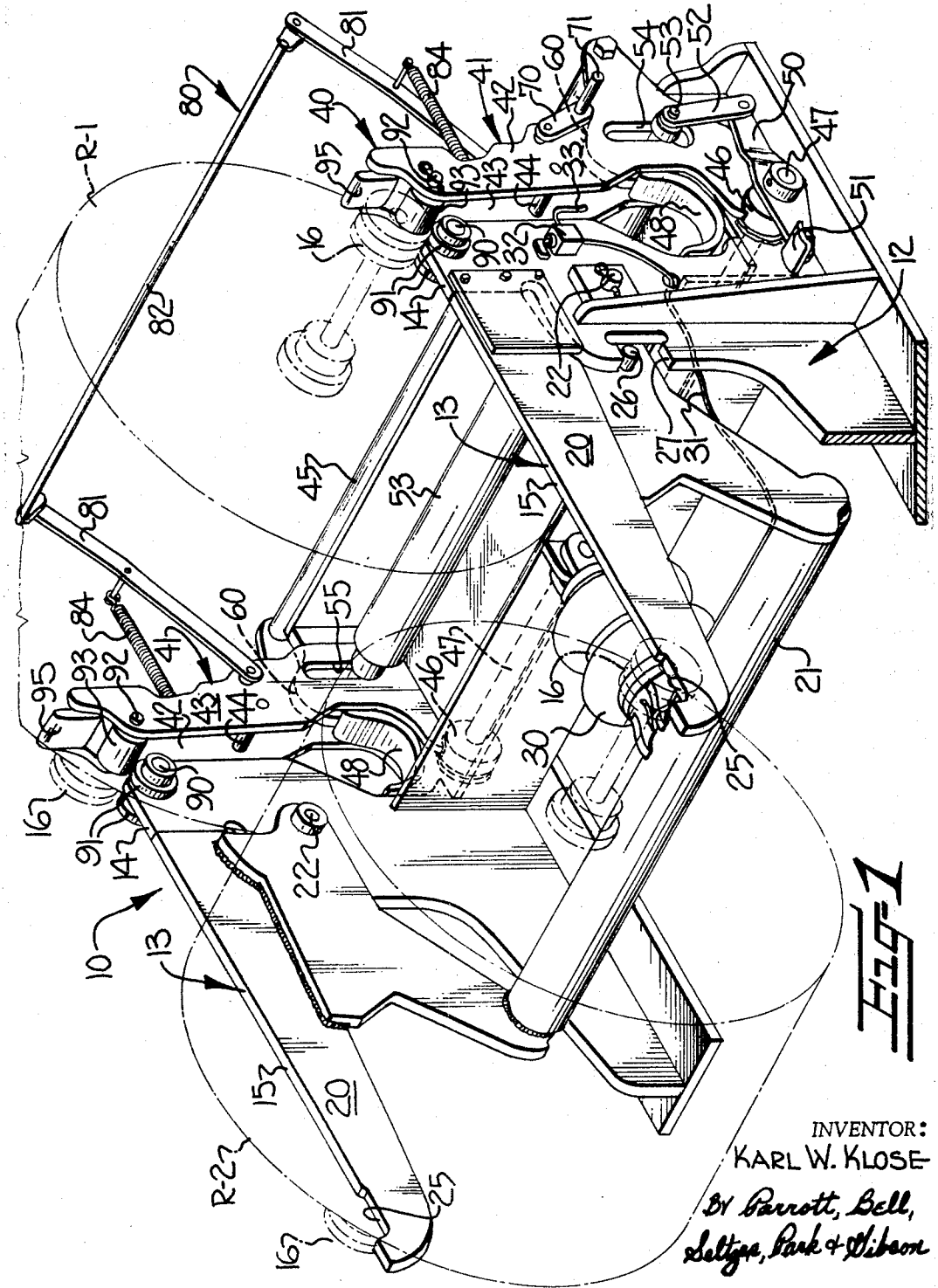


FIG. 1

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DUAL SUPPLY ROLL HANDLING MECHANISM

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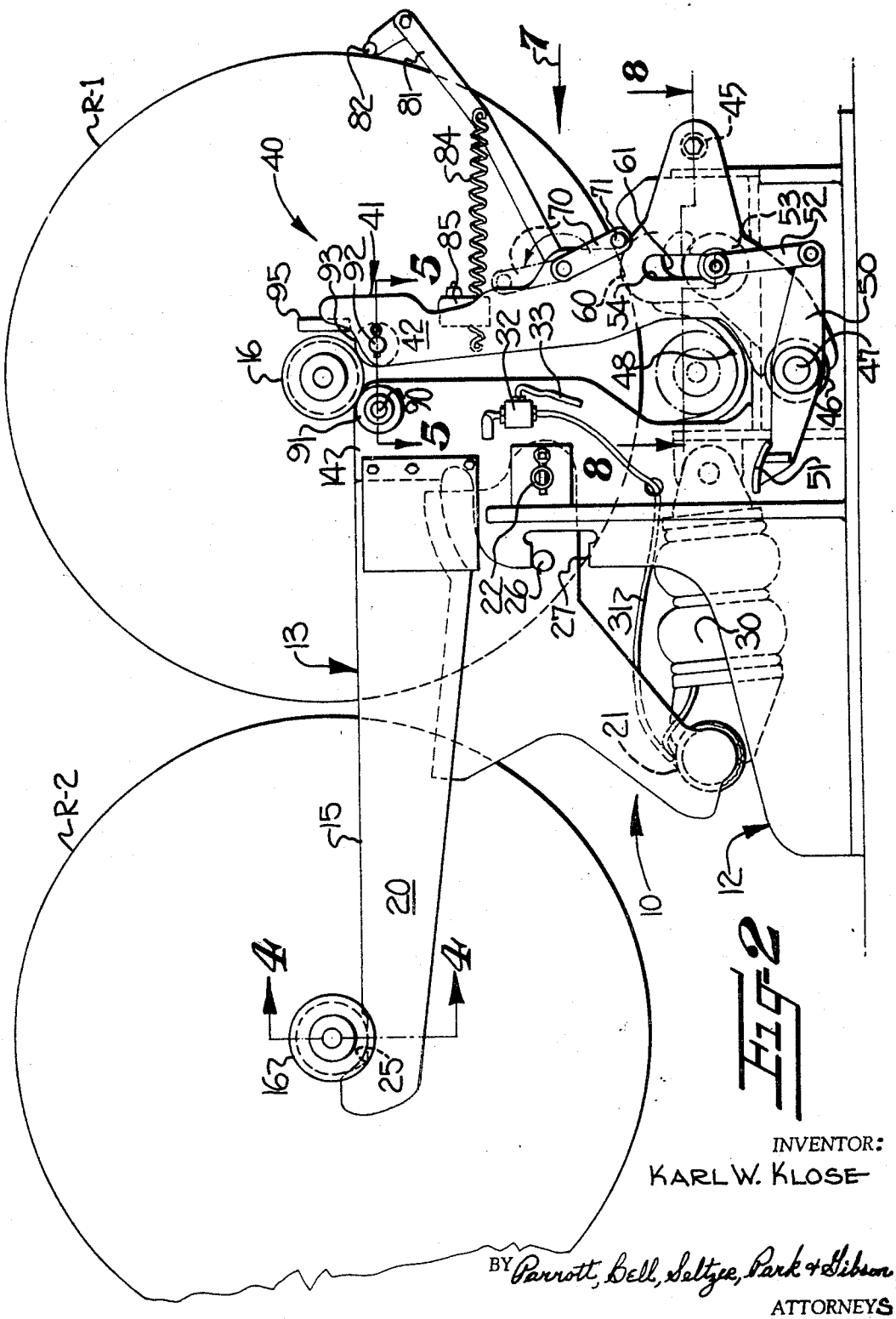


Fig. 2

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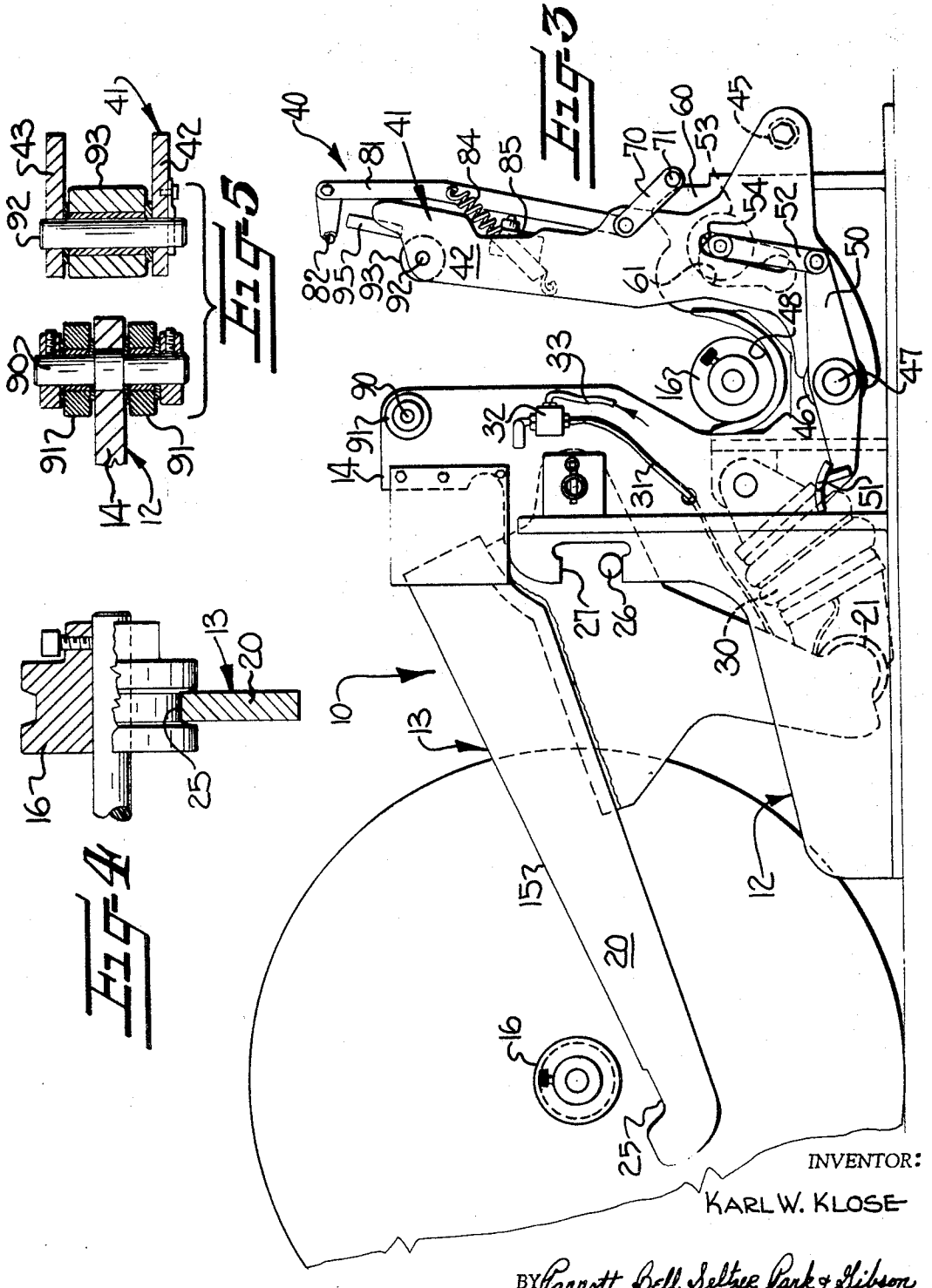

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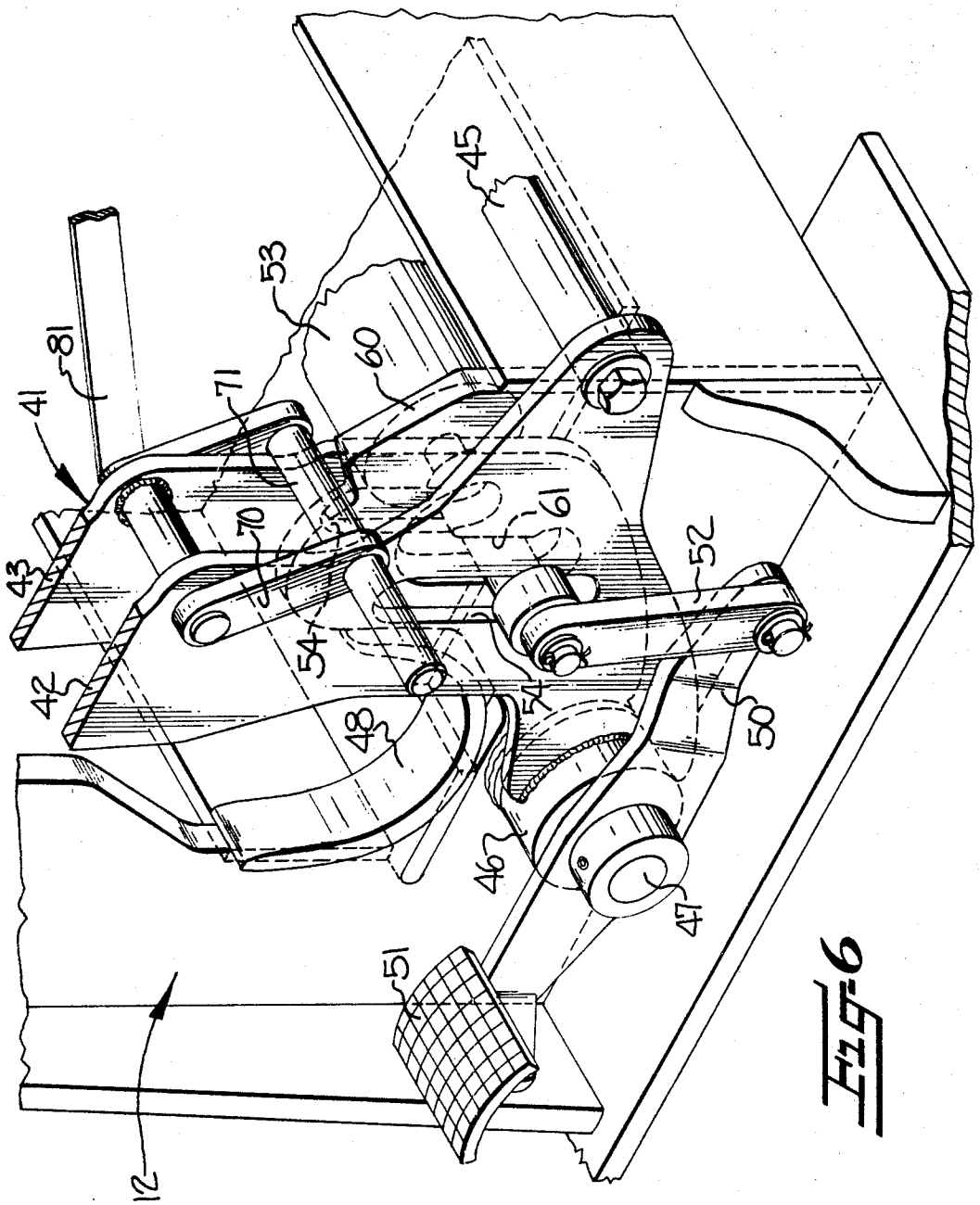


FIG. 6

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DUAL SUPPLY ROLL HANDLING MECHANISM

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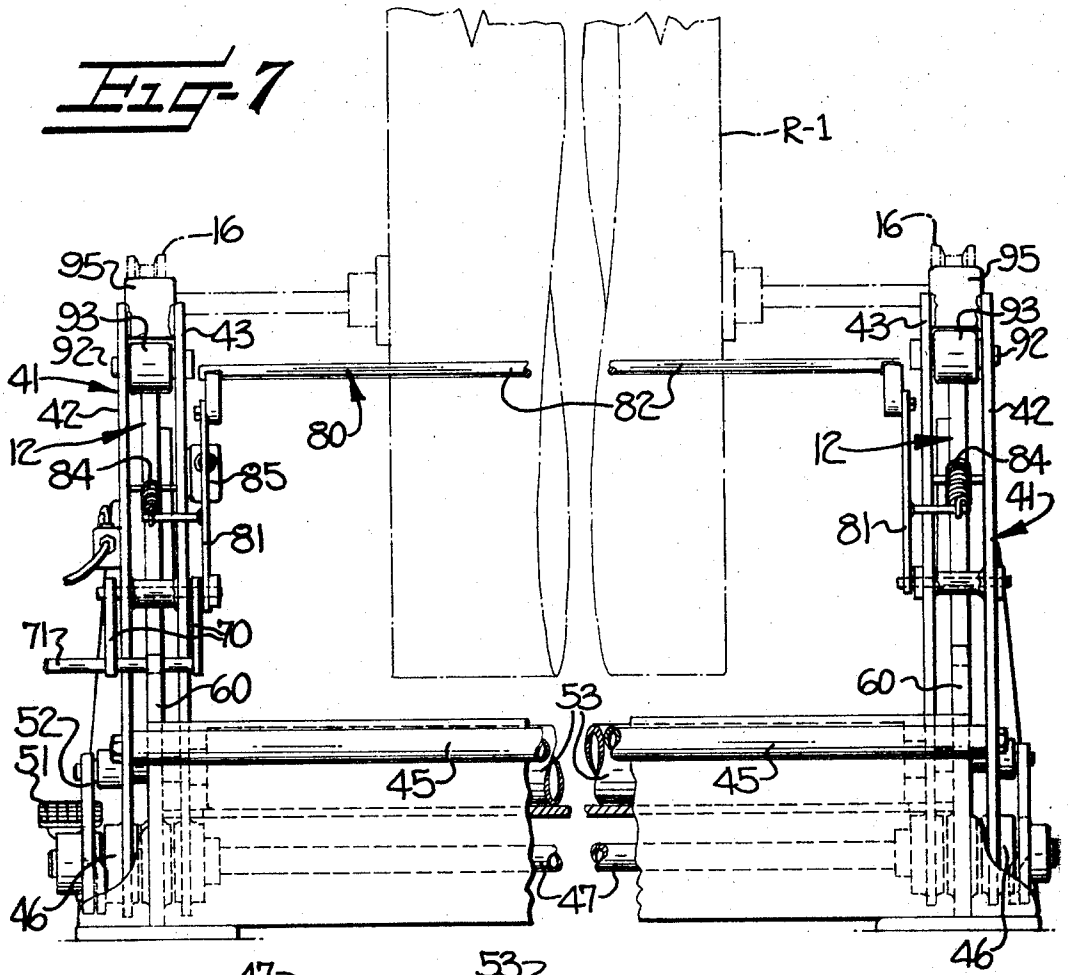
Fig-7



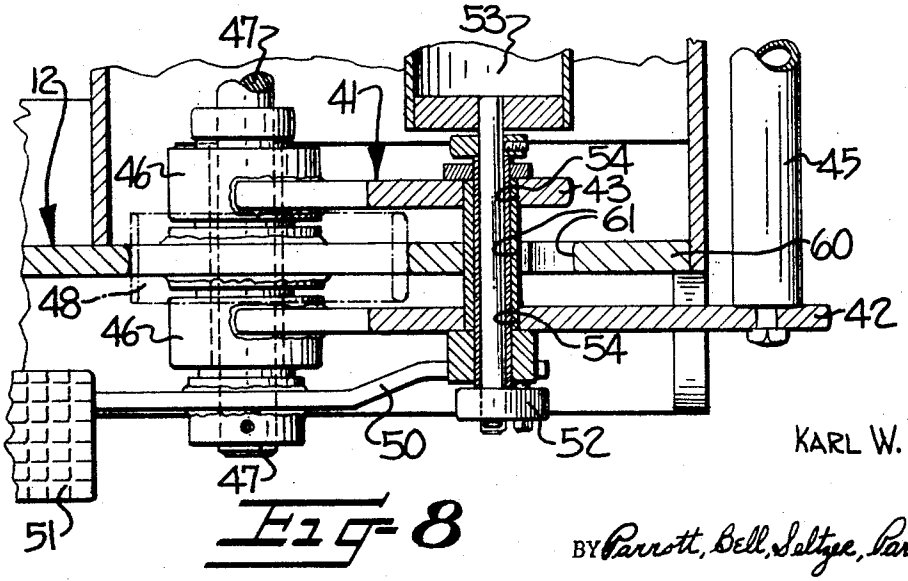




Fig-8

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United States Patent Office 3,474,978
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3,474,978

# DUAL SUPPLY ROLL HANDLING MECHANISM

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Int. Cl. B65q 57/00
U.S. Cl. 242—58 2 Claims

## ABSTRACT OF THE DISCLOSURE

A dual supply roll mechanism including means to lift supply rolls of material from the floor and to maintain a first supply roll thereon in a feeding position for supplying material to any desired machine and to maintain a second supply roll in a reserve position thereon for subsequent movement to the feeding position when the material on the first supply roll has been exhausted and which may include means for ejecting the first supply roll from the feeding position after the material thereon has been exhausted so that the second supply roll may be moved from the reserve position to the feeding position.

This invention relates to a dual supply roll handling mechanism and more specifically to such a mechanism adapted to lift supply rolls of material from the floor and to maintain a first supply roll thereon in a feeding position and a second supply roll thereon in a reserve position to be moved to the feeding position when the material on the first supply roll has been exhausted.

In the supplying of continuous webs of material, such as textile fabric, paper or the like, to various, fabricating or other types of machines, it has been the normal practice to provide supply rolls of continuous material which are manually placed on a roll stand or other handling mechanism. Quite often this has been a cumbersome and awkward procedure, particularly when using very heavy or large supply rolls of material, inasmuch as an operator, and sometimes a plurality of operators, must manually lift the supply rolls from the floor onto a roll stand or other handling mechanism. Also, the common practice has been to utilize a roll stand or other handling mechanism which will only accommodate a single supply roll and when the material on this supply roll has become exhausted, it is often necessary to shut down the machine using this material and to replace the exhausted supply roll with a new supply roll.

Roll stands or other handling mechanisms have been proposed in isolated instances which were adapted to lift supply rolls of material from the floor; however, these devices have not been practical inasmuch as they were very complicated mechanically, cumbersome and required a large number of mechanical or quasi-mechanical components.

It is, therefore, the object of this invention to provide a simple dual supply roll handling mechanism having a minimum of component parts which is easy to operate and which will eliminate the necessity of manual lifting by operators the large or heavy supply rolls from the floor onto the handling mechanism and which provides a handling mechanism accommodating a pair of supply rolls in a feeding position and in a reserve position so that the supply roll in the reserve position may be easily moved into the feeding position when the material on that supply roll has been exhausted and which may include means for ejecting an empty supply roll from the active position after the material thereon has been used up so that the supply roll in the reserve position may be moved to the active position.

It has been found by this invention that the above object may be accomplished by providing a dual supply roll handling mechanism comprising a stationary frame



portion for supporting the mechanism on a floor, a pair of spaced, parallel, horizontally-extending track means adapted to receive and support the ends of a pair of supply rolls positioned thereon in a feeding position and in a reserve position, respectively, and to allow movement therealong of the second roll from the reserve position to the feeding position when the material on the first roll is exhausted.

Each of the track means comprises a stationary section adapted to receive and maintain the first supply roll in the feeding position and a movable section adapted to receive the second supply roll from the floor in a lower position thereof and to move to an upper position thereof to lift and maintain the second supply roll in a reserve position substantially parallel with the first supply roll in the feeding position.

The handling mechanism also includes a simple air spring means which eliminates the necessity for a complicated mechanical arrangement and which is adapted to be expanded and contracted by the insertion and removal of air therein and which is operatively connected between the stationary frame portion and the movable section of the track means to move the movable section from the lower position thereof to the upper position thereof when expanded to lift and maintain the second supply roll in the reserve position.

The handling mechanism may also include movable ejection means which cooperates with the stationary sections of the track means in one position thereof to maintain the first supply roll in the feeding position and which is movable to a second position to eject the first supply roll from the feeding position after the material thereon has been exhausted.

Some of the objects of the invention having been stated, other objects will appear as the description proceeds when taken in conjunction with the accompanying drawings, in which:

FIGURE 1 is a perspective view of the dual supply roll handling mechanism of this invention;

FIGURE 2 is a side elevational view of the mechanism of FIGURE 1;

FIGURE 3 is a side elevational view, similar to FIGURE 2, but illustrating the movable section of the track means in its lower position for lifting a supply roll of material from the floor to the reserve position on the mechanism and illustrating the ejection means of the mechanism in the open position for ejecting an empty supply roll from the feeding position;

FIGURE 4 is a vertical, cross-sectional detail, taken along the line 4—4 of FIGURE 2, illustrating one end of a supply roll resting on the movable section of the track means;

FIGURE 5 is a horizontal, cross-sectional detail, taken along the line 5—5 of FIGURE 2, illustrating the mechanisms on which one end of the supply roll rests when positioned in the active po sition;

FIGURE 6 is an enlarged, partial, perspective view of a portion of the apparatus of FIGURE 1 illustrating some of the details of the ejection means;

FIGURE 7 is a partial, vertical, elevational view, broken away, viewing the mechanism from the right side as indicated by the line 7 in FIGURE 2; and

FIGURE 8 is a partial, horizontal, cross-sectional detail, taken along the line 8—8 of FIGURE 2, illustrating a portion of the mechanisms comprising the ejection means.

Referring now to the drawings, the dual supply roll handling mechanism of this invention is indicated generally therein by the reference numeral 10. As may be seen particularly in FIGURES 1, 2 and 3, the handling mechanism 10 is characterized by being adapted to lift supply rolls R–1 and R–2 of material from the floor and to maintain the first supply roll R–1 thereon in a feed-

ing position for supplying the material contained thereon to any desired machine and to maintain the second supply roll R–2 of material in a reserve position thereon for subsequent movement to the feeding position when the material on the first supply roll R–1 has been exhausted.

The handling mechanism comprises a stationary frame portion, generally indicated at **12**, for supporting the mechanism on a floor or other surface. The handling mechanism further comprises a pair of spaced, parallel, horizontally-extending track means, generally indicated at **13**, which are carried by the frame portion **12** and adapted to receive and support the ends of the pair of supply rolls R–1 and R–2 positioned thereon in the feeding position and in the reserve position, respectively, and to allow movement therealong of the second roll R–2 from the reserve position to the feeding position when the material on the first roll R–1 is exhausted.

Each of the track means **13** comprises a stationary section **14** adapted to receive and maintain the first supply roll in the feeding position. The stationary sections **14** are formed by the top edge of two upstanding portions of the stationary frame **12** and are adapted to hold the ends of either of the rolls R–1 or R–2 in a stationary position. The stationary portions **14** cooperate with other mechanisms, to be described hereinafter, for maintaining one of the rolls R–1 or R–2 in the feeding position. The rolls R–1 and R–2 include hubs **16** having central grooves therein on each end thereof which are adapted to straddle the track portions **13** for maintaining their position thereon.

Each of the track means **13** further comprises a movable section **15** adapted to receive the second supply roll R–2 from the floor in a lower position thereof and move to an upper position thereof to lift and maintain the second supply roll in a reserve position substantially parallel with the first supply roll R–1 in the feeding position, as may be seen in FIGURES 1–3. The movable sections are formed as the upper surfaces of parallel, normally horizontally-extending movable arms **20** each of which is pivoted at **22** by any suitable connection to the upstanding legs of the stationary frame portion **12**, as illustrated in FIGS. 1–3. The arms **20** are interconnected by a shaft **21** extending therebetween and having each end there of secured to a portion of the arms **20** such that the arms **20** form an integral structure which will move together about the pivot points **22** from a lower position for picking up a supply roll of material from the floor to an upper position, generally parallel with the stationary position **14** to maintain a supply roll of material in the reserve position. Complementary cut-outs **25** are formed along the movable portions **15** of the track means **13** to hold the ends of a supply roll of material therein and to prevent longitudinal movement thereof along the track means **13** until the supply roll of material R–1 in the active position has been exhausted and it is desired to move the supply roll of material R–2 from the reserve position to the active position.

The handling mechanism **10** further comprises an air spring means **30** suitably secured by a collar and bolt means to a transversely-extending portion of the stationary frame means **12** and the other end of which is suitably secured to the transversely-extending shaft **21** between the arms **20** of the movable sections **15** of the track means **13**. The air spring means **30** is a simple bellows-type air spring constructed of rubber or other suitable expandable material which is adapted to expand upon the insertion of air therein to raise the movable sections **15** from the lower position thereof, as illustrated in FIGURE 3, to the upper position thereof, as illustrated in FIGURES 1 and 2, when air is inserted therein and the spring is expanded to lift a supply roll of material from the flood to the reserve position, illustrated in FIGURE 2.

For supplying air or the like to the air spring means **30**, there is provided a conduit **31** having one end connected to the air spring means **30** and having the other end connected to a suitable manually-operated, multiple-position valve **32**. The valve **32** includes a conduit **33** extending therefrom and connected to any suitable source of air (not shown), so that when the valve is turned in one position thereof air may be supplied from the source through the conduit **33** to the conduit **31** and into the air spring means **30** for expanding the same for the purposes described above. The valve may also be turned to a second position in which the conduit **31** is exhausted through the valve **32** so that the spring means **30** will contract due to the weight of the movable sections **15** for lowering thereof to the position shown in FIGURE 3.

The arms **20** comprising the movable sections **15** of the track means **13** also include projecting lugs **26** extending laterally outwardly from each side thereof and which are received with a cut-out portion **27** in the upstanding legs of the stationary frame portion **12** so that the upward and downward movement of the movable sections **15** is limited or controlled by the length of the cut-out **27**, as may be seen in FIGURES 1–3.

From the above description, it may be seen that a supply roll of material may be rolled along the floor to a position in which the ends thereof overlie the arms **20**, when placed in their downward position illustrated in FIGURE 3, and that the valve **32** may be turned to its respective position in which air is supplied to the spring means **30** for extending the same to lift the arms **20** to their upward position, illustrated in FIGURE 2, for lifting the supply roll of material from the floor to the reserve position which is generally parallel with the supply roll in the active position. The arms **20** are retained in their upward position by maintaining air within the spring means **30** such that the same will remain in its expanded position.

When the supply roll of material R–1 in the active position has been exhausted, the supply roll of material R–2 in the reserve position may be easily manually rolled forward into the active position by very little effort on the part of the operator and just enough to move the hubs **16** on the supply roll R–2 from the slots or cut-outs **25** in the track means **13**. The movable sections **15** of the track means **13** may then be lowered to the position shown in FIGURE 3 for picking up another supply roll of material to position it in the reserve position for subsequent movement to the active position.

The handling mechanism **10** may further include an ejector means, generally indicated in the drawings at **40**. This ejector means cooperates with the stationary sections **14** of the track means **13** in one position thereof to maintain the supply roll in the feeding position, as illustrated in FIGURES 1 and 2, and is adapted to be moved to a second position, as illustrated in FIGURE 3, to eject the first supply roll from the feeding position after the material thereon has been exhausted.

The ejector means **40** comprises a pair of movable, generally vertically-extending, parallel sections **41**, each of which is pivotally mounted, as specifically described below, to the stationary frame **12**. Each of the vertically-extending sections **41** comprises a pair of plates **42** and **43** secured together by any suitable bolt or stud means **44**. Extending between the vertically-extending sections **41** is a shaft **45** which has each of its ends secured to a portion of the plates **42** so that the sections **41** will move together, as discussed below. The plates **42** and **43** making up the upstanding sections **41** are secured for pivotal movement on the hubs **46** which are movably mounted on each end of a shaft **47** which is carried in suitable bearings on the upstanding portions of frame **12**.

By this arrangement, the upstanding sections **41** of the ejector means **40** are adapted to pivotally move from the position illustrated in FIGURES 1 and 2, in which the upper portions thereof cooperate with the stationary sections **14** to maintain a supply roll R–1 of material in the active position, to the position illustrated n FIGURE 3, in which the upstanding sections **41** are away from the

stationary sections 14 to allow an empty supply roll to drop therebetween and be caught on retainer members 48 positioned between the upstanding sections 41 and the stationary sections 14, as illustrated in FIGURE 3.

For providing the above-described arcuate movement of the upstanding portions 41 of the ejector means 40 for ejecting an empty supply roll, there is provided a lever 50 secured to the shaft 47 and adapted to move the shaft 47 upon movement of the lever 50. The shaft 47 is mounted through the hubs 46 and the bearings on the machine frame 12 such that movement of the lever 50 and movement of the shaft 47 does not move the hubs 46. The lever 50 includes a foot pedal 51 on one end thereof and is pivotally connected to a second lever 52 at the other end thereof. The lever 52 at its other end is fixedly connected to one end of a shaft 53 which has the ends thereof passing through complementary generally vertically-extending slots 54 and 55 in the plates 42 and 43 in both of the upstanding members 41 of the ejector means 40 such that when the foot pedal 51 is depressed, the other end of the lever 50 will move upwardly carrying the lever 52 and the shaft 53 upwardly in the slots 54 and 55.

Cooperating with these mechanisms are stationary plates 60 mounted on the machine frame 12 and extending generally vertically upwardly between the plates 42 and 43 in each of the upstanding portions 41 and having a camming slot 61 therein which is generally dog-legged shaped, as shown in FIGURES 2, 3 and 6. The respective ends of the shaft 53 pass through the dog-legged shaped slots 61 in the plates 60 and upon reaching the upper end of the slots 61 will be forced to the right in the dog-legged portion thereof so that the upstanding sections 41 will be cammed to the right, as viewed in FIGURE 3, which will move the upstanding sections 41 away from the stationary sections 14 for providing the ejecting action.

The upstanding sections 41 may then be moved back into the position illustrated in FIGURES 1 and 2 by manual movement thereof which will cause the ends of the shaft 53 to again ride around the dog-legged shaped slots 61 in the stationary plates 60 to cam the upstanding portions 41 back to their original positions.

For latching the upstanding portions 41 in the position illustrated in FIGURES 1 and 2 for retaining supply roll R–1 of material in the feeding position, there is provided a latching mechanism comprising a pair of levers 70 each of which has one end secured to respective upstanding portions 41 and the other end carries the outer end of a shaft 71 which interconnects the two. The shaft 71 is adapted, when in the downward position thereof illustrated in FIGURES 1 and 2, to engage a cut-out or groove in the upstanding stationary plates 60 such that the upstanding portions 41 may not move. When it is desired to move these upstanding portions 41 to the ejecting position, shown in FIGURE 3, the levers 70 and shaft 71 are manually moved upwardly such that they disengage the cut-out portion in the upstanding plates 60.

The dual roll handling mechanism 10 may further include a material indicator 80 comprising a pair of arms 81 each of which has one end pivotally secured to the plates 43 and has a shaft 82 extending therebetween at the other ends thereof. The arms 81 and the shaft 82 are spring biasd toward the upstanding sections 41 by springs 84 having one end thereof secured to the arms 81 and the other end thereof secured to the upstanding portions 41. As indicated in FIGURES 1 and 2, the shaft 82 engages the outside surface of the material on the supply roll R–1 and moves toward the upstanding portions 41 as the material thereon is used up. Mounted on one of the upstanding sections 41 is a suitable electrical switch 85 which is adapted to be engaged by one of the arms 81 when the material on the supply roll R–1 is exhausted. This electrical switch 85 may be suitably electrically connected to a light, bell or other suitable warning apparatus which will indicate when the material on the supply roll R–1 has been used up and it is time for the supply roll R–2 of material to be moved into the active or feeding position.

For aiding the supply roll of material to rotate for feeding the material thereon to any desired machine, there is provided shafts 90 rotatably mounted in the stationary sections 14 and having roller means 91 on the outer ends thereof to be engaged by the hubs 16 on the ends of the supply rolls for rotative movement. Similarly, there is provided a shaft 92 extending between the plates 42 and 43 of the upstanding sections 41 of the ejector means which carries a roller 93 between the plates for engagement by the hubs 16 on the end of the supply roll for rotating movement. Also, the mechanism may include a stop 95 secured between the plates 42 and 43 of the upstanding portions 41 of the ejector means 40 for preventing movement of the supply roll of material off the mechanism.

Thus, it may be seen from the above-described mechanisms that the dual roll handling mechanism 10 may include a movable ejector means which cooperates with the stationary sections of the track means in one position thereof to maintain a supply roll in the feeding position and which is movable to a second position to eject the supply roll from the feeding position after the material thereon has been exhausted.

In the drawings and specification, there has been set forth a preferred embodiment of this invention and, although specific terms are employed, they are used in a descriptive sense only and not for purposes of limitation.

What is claimed is:

1. A dual supply roll handling mechanism characterized by being adapted to lift supply rolls of material from the floor and to maintain a first supply roll thereon in a feeding position for supplying material to any desired machine and to maintain a second supply roll thereon in a reserve position for subsequent movement to the feeding position when the material on the first supply roll has been exhausted; said mechanism comprising:

(a) a stationary frame portion for supporting said mechanism on a floor;

(b) a pair of spaced, parallel, horizontally-extending track means carried by said frame portion and adapted to receive and support the ends of the pair of supply rolls positioned thereon in the feeding position and in the reserve position, respectively, and to allow movement therealong of the second roll from the reserve position to the feeding position when the material on the first roll is exhausted, each of said track means comprising

(1) a stationary section adapted to receive and maintain the first supply roll in the feeding position and having an upper linear tracking surface for allowing movement of the supply rolls therealong, and

(2) a movable section adapted to receive the second supply roll from the floor in a lower position thereof and move to an upper position thereof to lift and maintain the second supply roll in a reserve position substantially parallel with the supply roll in the feeding position, said movable section comprising an elongate arm pivotally mounted to said stationary frame portion and being connected with, spaced from and parallel with the elongate arm of the movable section of said other track means and including an upper linear tracking surface which assumes a position in axial longitudinal alignment with said tracking surface of said stationary section when said movable section is in the upper position thereof so as to jointly form a linear tracking surface with said upper tracking surface of said stationary section for movement of the supply rolls therealong; and

(c) air spring means adapted to be expanded and contracted by the insertion and removal of air therein

and being operatively connected between said stationary frame portion and said movable sections of said track means to move said movable sections from the lower position thereof to the upper position thereof when expanded to lift and maintain the second supply roll in the reserve position.

2. A dual supply roll handling mechanism characterized by being adapted to lift supply rolls of material from the floor and to maintain a first supply roll thereon in a feeding position for supplying material to any desired machine and to maintain a second supply roll thereon in a reserve position for subsequent movement to the feeding position when the material on the first supply roll has been exhausted and to eject the first supply roll from the feeding position when the material thereon has been exhausted so that the second supply roll may be moved into the feeding position; said mechanism comprising:

(1) a stationary section adapted to receive and mechanism on a floor;

(b) a pair of spaced, parallel, horizontally-extending track means carried by said frame portion and adapted to receive and support the ends of the pair of supply rolls positioned thereon in the feeding position and in the reserve position, respectively, and to allow movement therealong of the second roll from the reserve position to the feeding position when the material on the first roll is exhausted, each of said track means comprising

(3) a stationary section adapted to receive and maintain the first supply roll in the feeding position, and

(2) a movable section adapted to receive the second supply roll from the floor in a lower position thereof and move to an upper position thereof to lift and maintain the second supply roll in a reserve position substantially parallel with the first supply roll in the feeding position;

(c) air spring means adapted to be expanded and contracted by the insertion and removal of air therein



and being operatively connected between said stationary frame portion and said movable sections of said track means to move said movable sections from the lower position thereof to the upper position thereof when expanded to lift and maintain the second supply roll in the reserve position; and

(d) movable ejection means cooperating with said stationary sections of said track means in one position thereof to maintain the first supply roll in the feeding position and being movable to a second position to eject the first supply roll from the feeding position after the material thereon has been exhausted, said ejection means comprising a pair of movable, generally vertically-extending sections pivotally mounted to said stationary frame and the upper surface of which in one position thereof cooperates with said stationary sections of said track means to maintain the first supply roll in the feeding position and said vertically-extending sections being movable to a second position away from said stationary sections which allows the first supply roll to drop therebetween for ejection.

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U.S. Cl. X.R.

214—130

PO-1050
(5/69)

# UNITED STATES PATENT OFFICE
# CERTIFICATE OF CORRECTION

Patent No. 3,474,978 Dated October 28, 1969

Inventor(s) Karl W. Klose

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 3, line 48, "position" (second occurrence) should be --portion--; line 72, "flood" should be --floor--. Column 7, Claim 2, lines 18 and 19, delete "(1) a stationary section adapted to receive and mechanism on a floor" and add --(a) a stationary frame portion for supporting said mechanism on a floor--; line 29, "(3)" should be --(1)--.

SIGNED AND
SEALED
JUN 2 1970

(SEAL)
Attest:

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Attesting Officer

WILLIAM E. SCHUYLER, JR.
Commissioner of Patents