United States Patent

Upshur et al.

[15] **3,650,419**

[45] **Mar. 21, 1972**

[54] CLOTH DOFFING MECHANISM

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[22] Filed: **Feb. 25, 1970**

[21] Appl. No.: **13,968**

[52] **U.S. Cl.**.....**214/38 B**, 28/41, 214/77, 214/85, 214/DIG. 4, 242/58.6, 280/47.12, 280/79.3

[51] **Int. Cl.**.....**B65g 67/02**

[58] **Field of Search**.....214/38 R, 38 B, 38 BA, 38 BB, 214/DIG. 4; 28/77, 85, 41; 242/58.6; 280/47.12, 79.3

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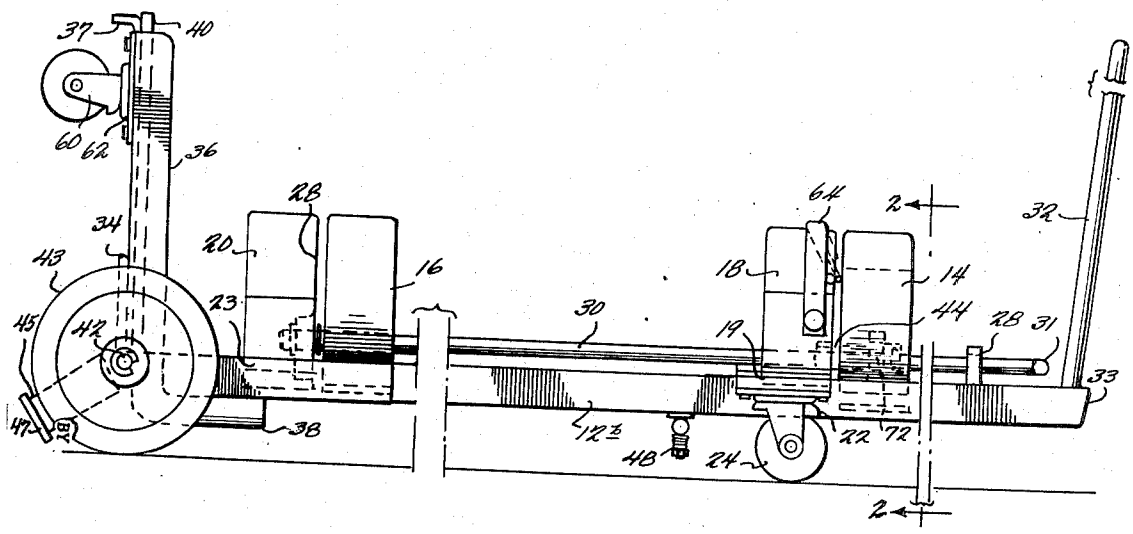
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[57] **ABSTRACT**

A mechanism is described for removing a filled cloth roll from a loom and for transporting a plurality of said removed said filled cloth rolls away from the loom area. A doffing cart is provided which is adapted to be placed adjacent the horizontally extending filled cloth roll on the loom and includes means for lifting the roll, when detached, horizontally onto the cart. The doffing cart with the filled cloth roll secured thereto may then be lifted to an upright position, where the filled cloth roll extends vertically, and the doffing cart may then be rolled away from the loom in the narrow aisles generally provided between looms. A receiving cart is provided which is adapted to receive the filled cloth roll from the doffing cart, store a plurality of said rolls and transport said plurality of rolls away from the loom area. Further, the receiving cart may store a number of empty rolls for installation in the looms when the filled rolls are removed therefrom. The doffing cart includes a tongue means adapted to be engaged with a coupling bar on the receiving cart placing the platform which supports the vertical filled cloth roll on the doffing cart substantially flush with the floor of the receiving cart so that the filled cloth roll need only be slid from one cart to the other.

8 Claims, 19 Drawing Figures



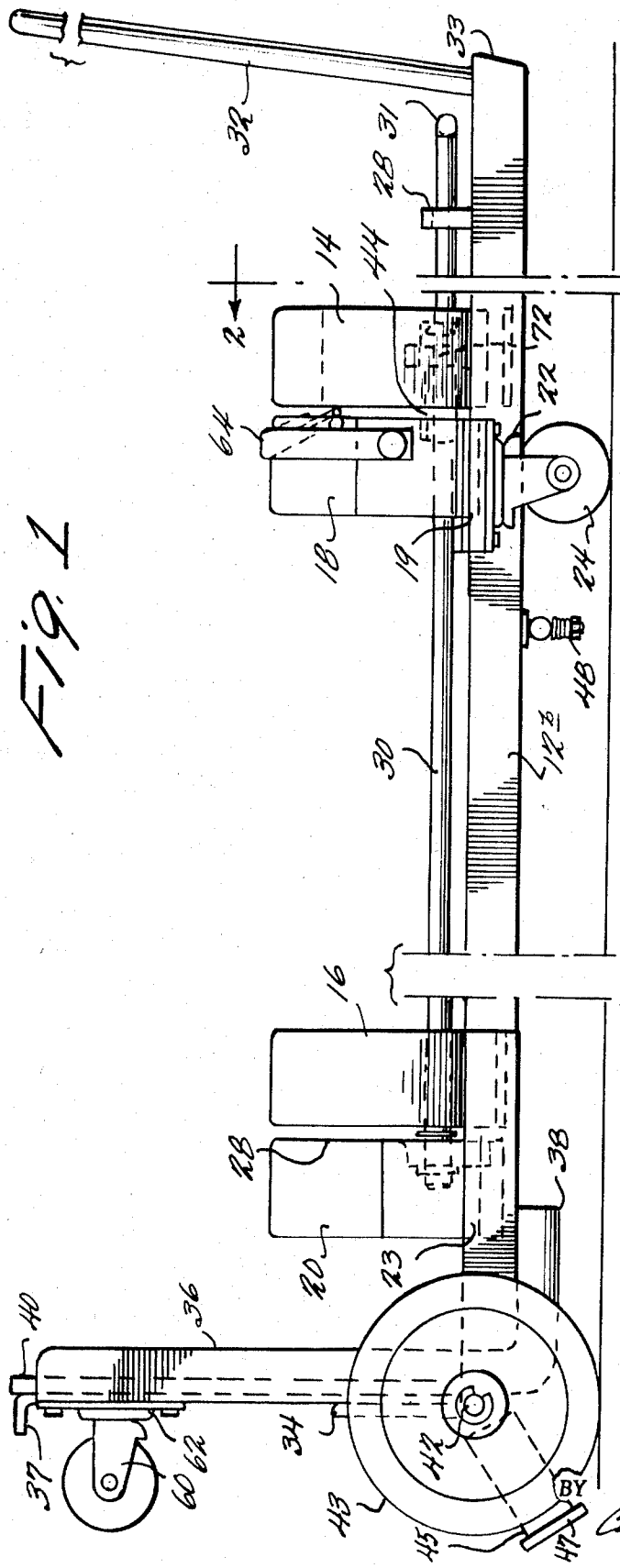


Fig. 1

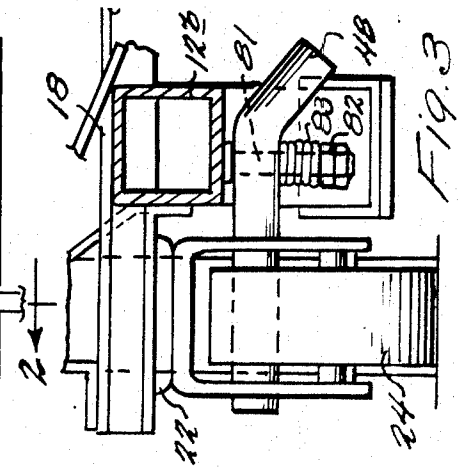


Fig. 3

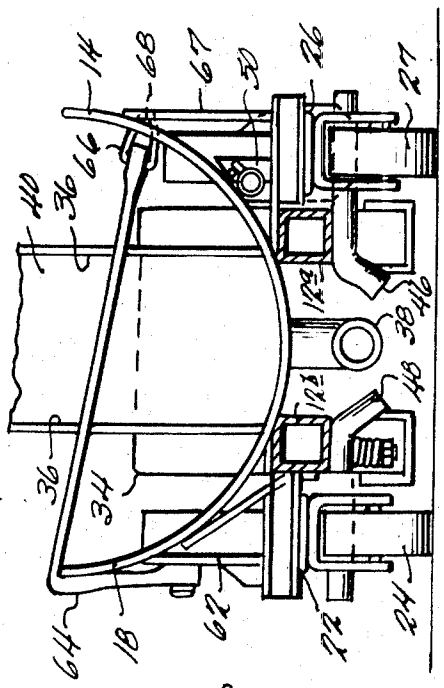
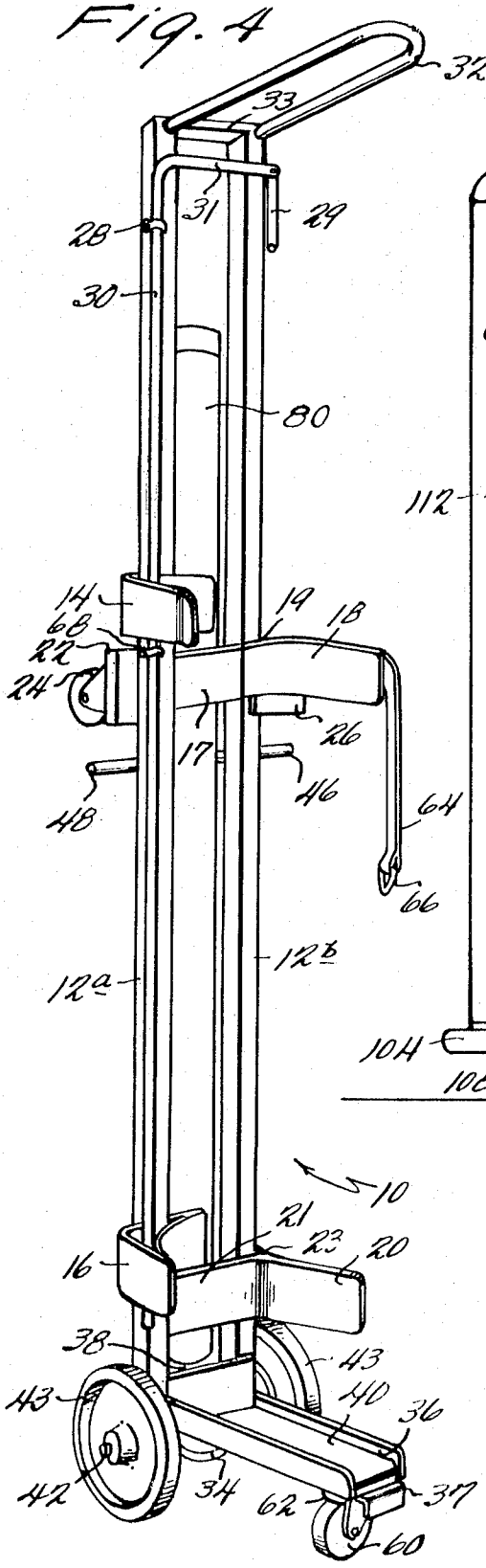


Fig. 2

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Fig. 4



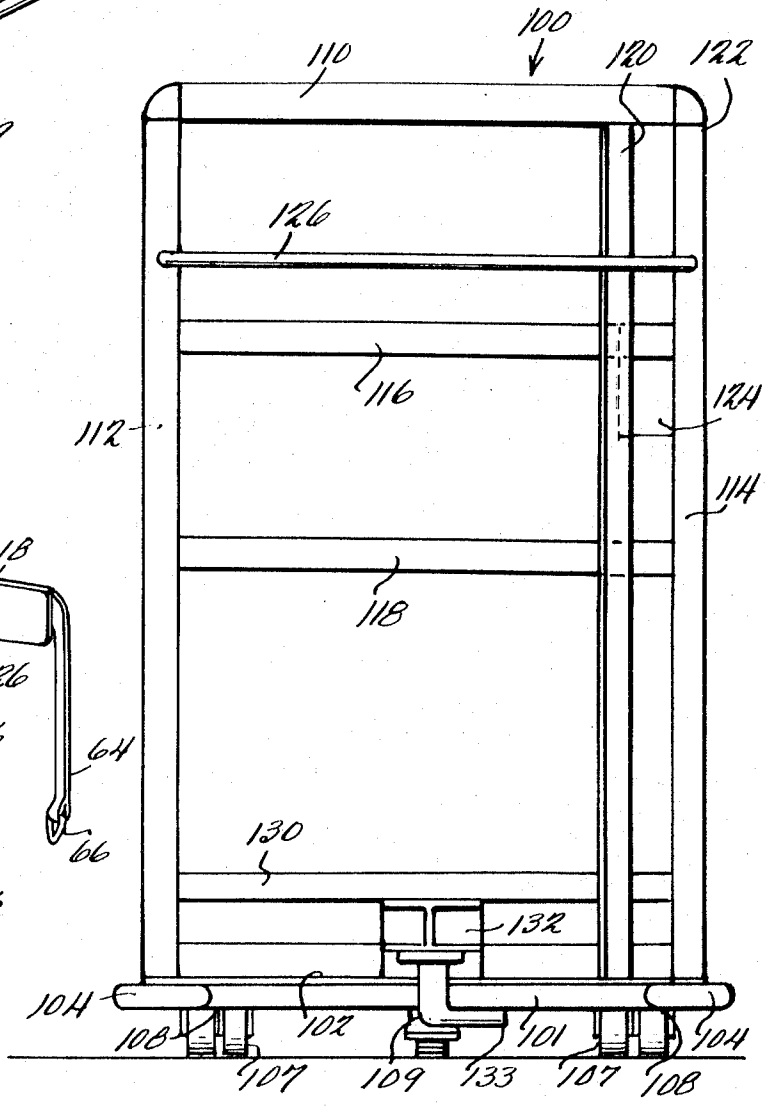


Fig. 5

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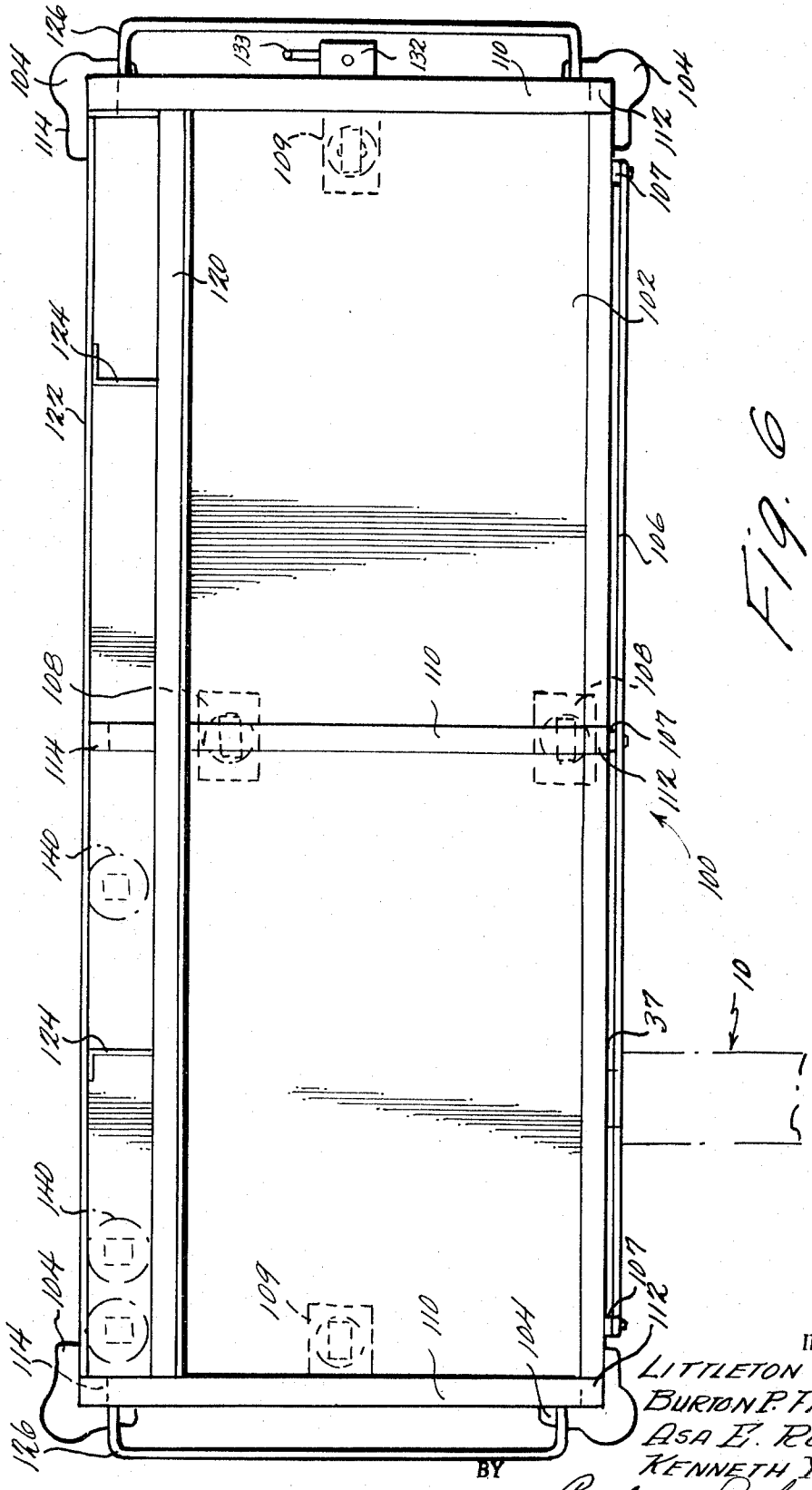


Fig. 6

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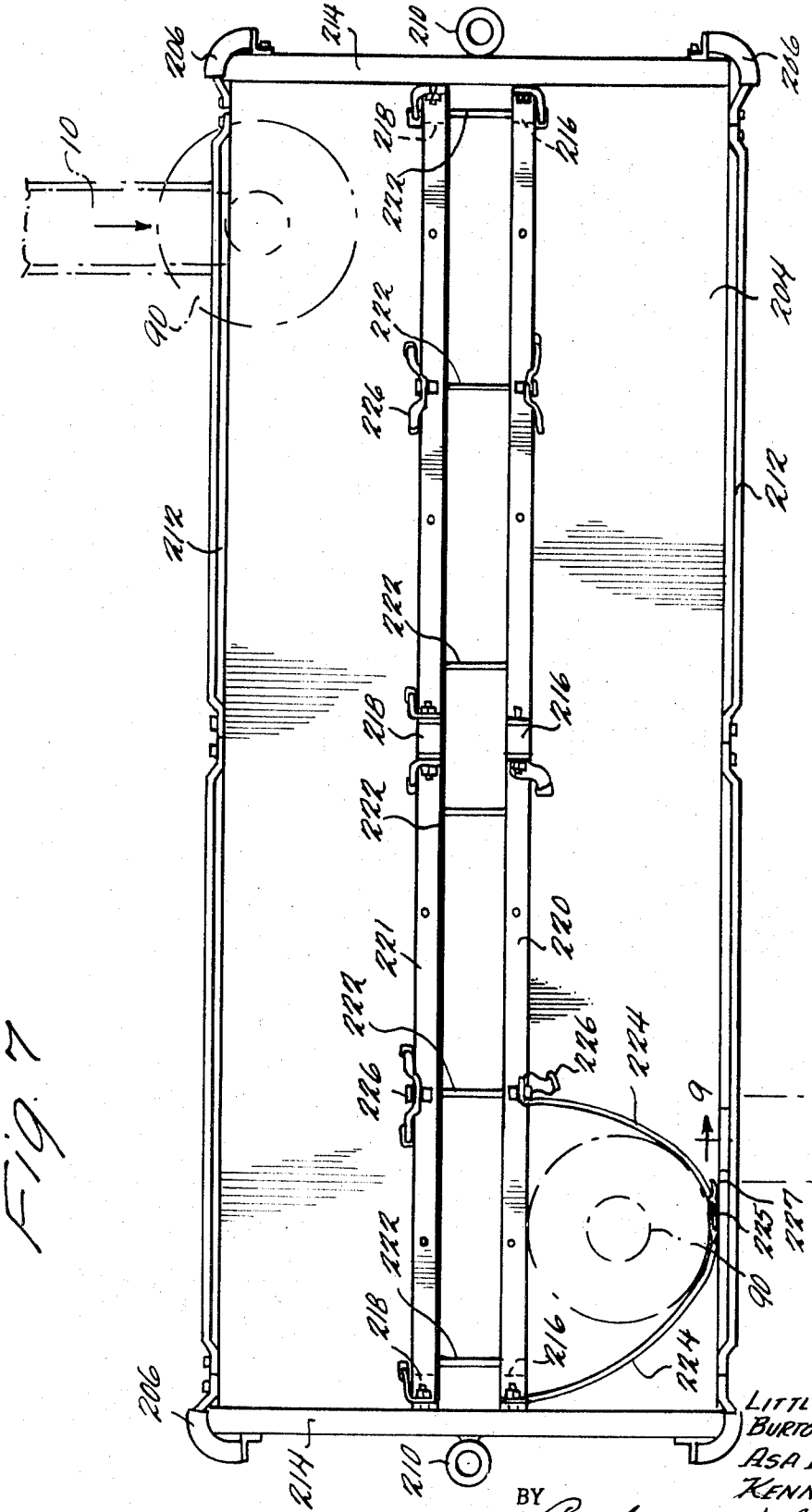


Fig. 7

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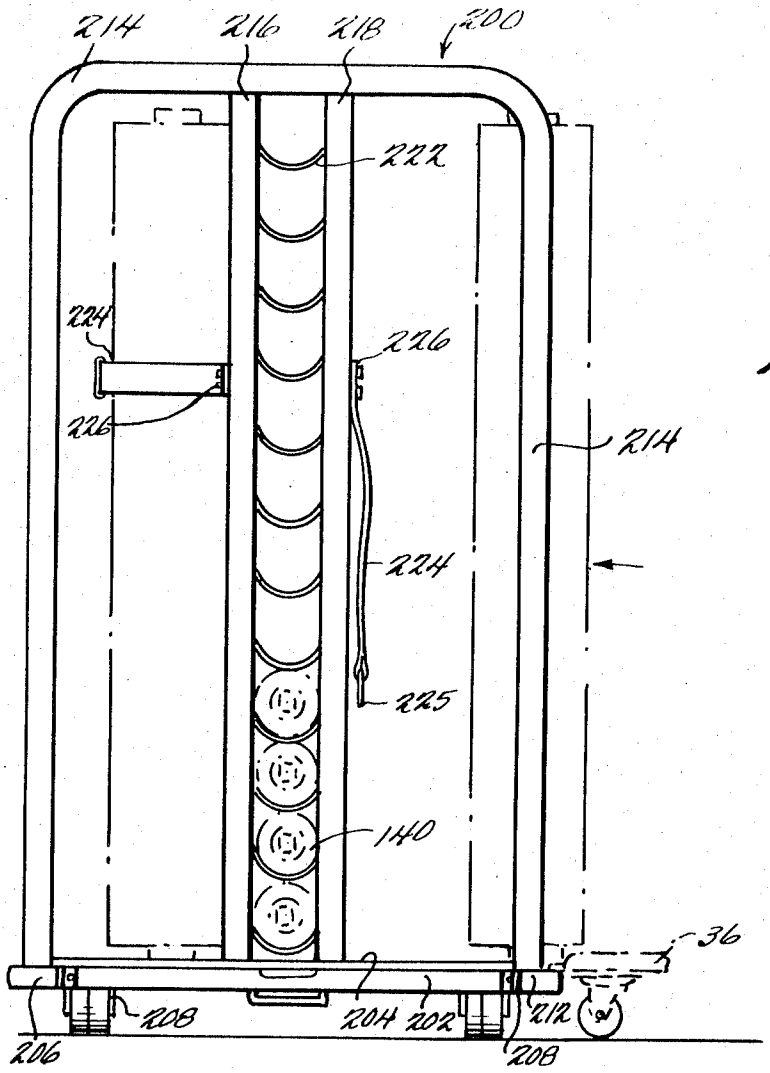


Fig. 8

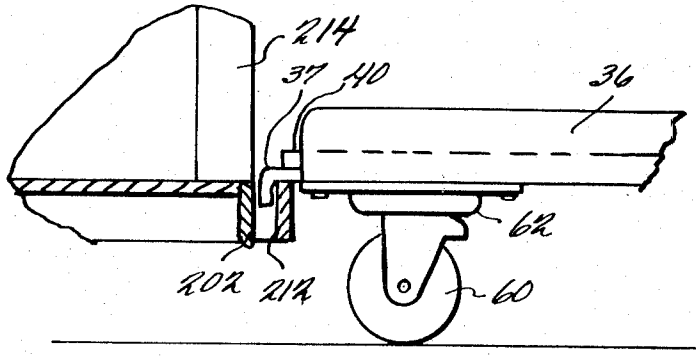


Fig. 9

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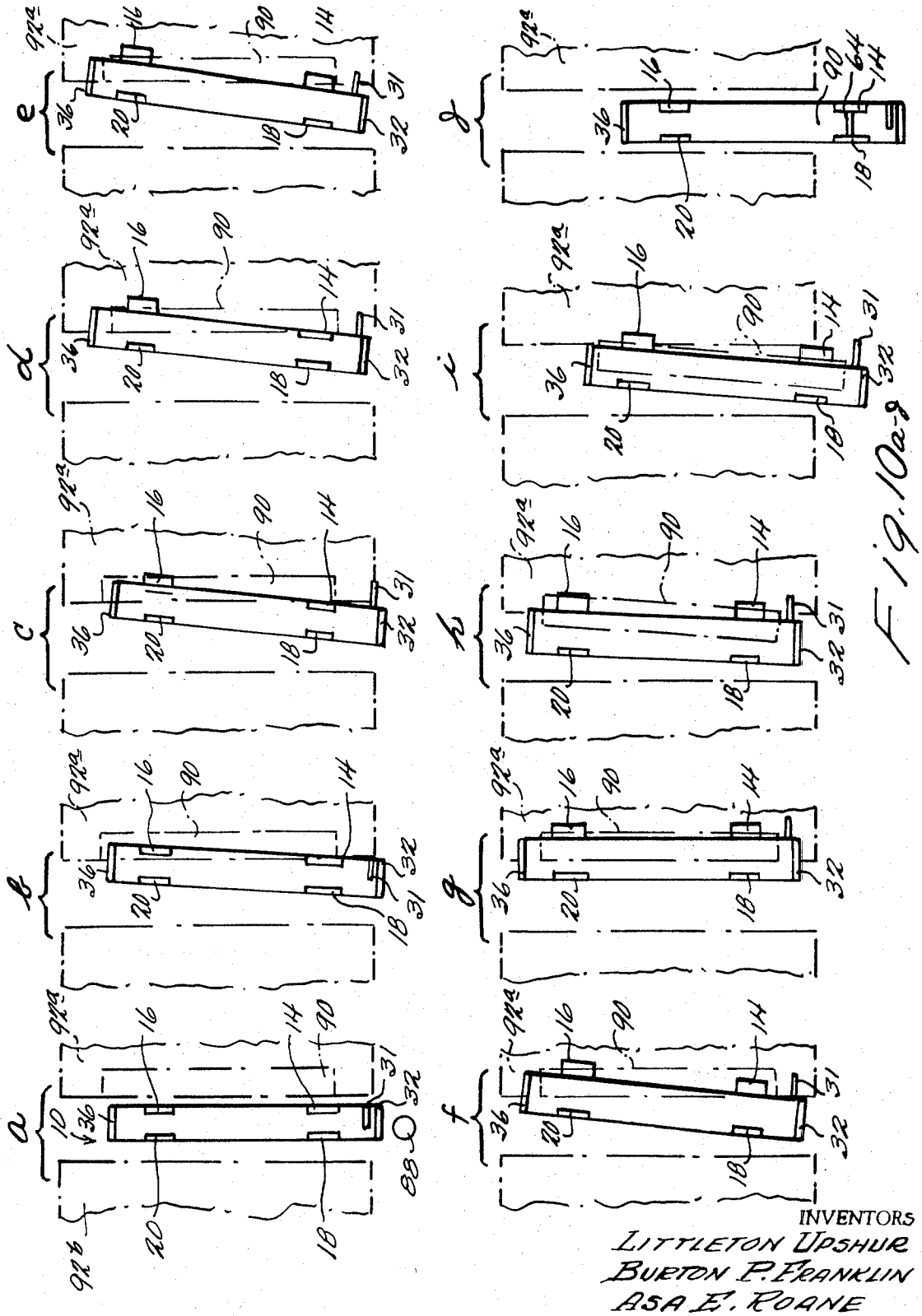


Fig. 10a-g

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CLOTH DOFFING MECHANISM

This invention relates to an assembly for removing a filled cloth roll from a loom, lifting said cloth roll to a vertical position, transporting said cloth roll away from said loom to a receiving means and wherein said receiving means is adapted to receive and store a plurality of said filled cloth rolls and transport same away from the loom area. In particular, this invention relates to cart means for transporting a filled cloth roll, said cart means including means for lifting a detached filled cloth roll onto said cart and transporting same away from the loom, and in addition, a cart means for receiving a plurality of the filled cloth rolls from a doffing cart or carts for transporting the plurality of filled cloth rolls from the loom area.

It is well known that the filled cloth rolls on looms are very heavy and bulky making them difficult to manipulate. Further, it is generally the case that in a loom area a number of looms are placed very close together so that the aisles provided therebetween for removing filled rolls and installing empty rolls are quite narrow making it difficult to manipulate the heavy, bulky filled cloth rolls therein. At the present time, the filled cloth rolls are generally removed from the looms manually, and the worker must then manipulate the roll through the narrow aisle between looms and carry it to a storage area. In performing this task he is required to bend or stoop to grasp the filled cloth roll, detach it from the loom, lift himself and the filled cloth roll to an upright position and manipulate the heavy, bulky filled cloth roll outwardly from between the looms in the very narrow aisle provided therefor. Further, he is often required to carry this very heavy roll a substantial distance to a storage area. In addition, in removing the filled cloth roll from the loom it is necessary to install therein an empty roll so that either the worker removing the filled roll must also manipulate an empty roll or an additional worker must be provided to install empty rolls to replace the filled rolls. It can be seen that the manual labor required in carrying out this operation is costly and time consuming in addition to being difficult.

It is therefore an object of this invention to provide a means for removing filled cloth rolls from looms and transporting same away from the loom area which will reduce the manual labor involved to a minimum.

Another object of this invention is to provide a means for manipulating a filled cloth roll from a loom in a very narrow area.

A further object of this invention is to provide a means for lifting the horizontally extending filled cloth roll which has been detached from a loom onto a cart means, said cart means being adapted to be raised to a vertical position and moved away from the loom in the very narrow aisles provided between looms.

Still another object of this invention is to provide means for transporting a plurality of filled cloth rolls away from the loom area, said means being adapted to be engaged with the cart means defined in the object immediately above so that the filled cloth roll may be removed from the above-described cart means to the means described herein without requiring manual lifting.

The aforementioned and other objects are provided in any assembly which comprises a first cart means for receiving and having secured thereto a horizontally removable cloth roll from a loom and a second cart means for receiving and storing a plurality of the filled cloth rolls. The first cart means is adapted to move the detached horizontally extending filled cloth roll onto said first cart, raise the cart to a vertical position and transport same through the narrow aisles between looms. The first cart means includes movable arms for lifting the filled cloth roll onto the cart. The second cart means is adapted to receive a plurality of the filled cloth rolls in the vertical or upright position, and it also includes a storage area for empty rolls to be used for replacing the filled rolls on the looms. The first cart includes a platform upon which an end of the filled cloth roll rests when in the vertical or upright position and this platform is designed to be a height corresponding to the height from the loom room floor of a similar supporting surface on the second cart. A means for coupling the first cart to the second cart is provided so that the filled cloth roll may be slid from one to the other without requiring manual lifting.

The principles of this invention may be best understood by reference to a description hereinbelow of a preferred embodiment of an assembly which is constructed and designed to operate according to said principles in conjunction with the drawings in which:

FIG. **1** is a fragmented side elevation of a preferred embodiment of the doffing cart adapted to receive and have secured thereto the filled cloth roll from the loom; the doffing cart is shown in the horizontal position adapted to receive the horizontally extending cloth roll;

FIG. **2** is a cross section of the doffing cart illustrated in FIG. **1** taken along the line **2—2**;

FIG. **3** is an expanded fragmentary view of the cross section illustrated in FIG. **2** taken along the line **3—3**;

FIG. **4** is a perspective view of the doffing cart illustrated in FIG. **1** with an empty roll, which is adapted to replace the filled roll on the loom, shown in place on the doffing cart;

FIG. **5** is an end elevation of a first preferred embodiment of a receiving cart for receiving a plurality of the filled cloth rolls as well as storing a number of empty rolls for replacement in the looms;

FIG. **6** is a top elevation of the first preferred embodiment of the receiving cart illustrated in FIG. **5**;

FIG. **7** is a top elevation of a second preferred embodiment of a receiving cart;

FIG. **8** is an end elevation of the second preferred embodiment of the receiving cart illustrated in FIG. **7**;

FIG. **9** is a fragmentary view showing the doffing cart illustrated in FIGS. **1–4** as being engaged with the receiving cart illustrated in FIGS. **7** and **8** for transferring a filled cloth roll from the doffing cart to the receiving cart; and

FIGS. **10***a–j* are diagrammatic top elevations of the doffing cart illustrating the manipulations required of the doffing cart to place the filled cloth roll thereon.

While the assembly constructed according to the principles of this invention comprises two elements, namely a doffing cart and a receiving cart, the structural details of these elements will be described separately hereinbelow.

In FIGS. **1–4** a preferred embodiment of the doffing cart for directly receiving the filled cloth roll from the loom and having same secured thereon for transporting the filled cloth roll in the narrow aisle between looms is described. In these figures as well as all of the other figures of the drawings like elements are indicated by like numerals.

The doffing cart, generally indicated by the numeral **10**, has a frame structure comprised of two horizontally spaced elongated frame members **12***a* and **12***b* which are shown in a horizontal position in FIG. **1** and in the vertical position in FIG. **4**. The frame members **12***a–b* are separated by a cover plate **33** at the top or end of the cart, and a U-shaped handle **32** is attached between frame members **12***a* and **12***b* at this point. An angle bracket **34** attached to the frame members **12***a–b* is provided at the end of the cart remote from cover plate **33**. The space between the frame members **12***a* and **12***b* is of a width which will allow the width of a filled cloth roll to be accommodated therebetween, but which will allow the width of the doffing cart defined by the distance between said frame members **12***a* and *b* to be accommodated in the narrow aisles usually found between looms. Depending on the position of the cart, angle bracket **34** extends horizontally or vertically and supports a channel-shaped platform member **36**. As shown in FIG. **1**, the cart, particularly frame members **12***a* and **12***b*, is extended horizontally. The platform **36** is equipped with a floor surface **40** which is of a friction-reducing material; in the preferred embodiment nylon is used for this purpose, but any similar material achieving the desired result may be used. The bight portion of channel-shaped platform **36** which supports floor surface **40** extends forwardly and outwardly

thereof and is bent substantially perpendicularly with the floor surface **40** to form a tongue **37**, the purpose for which will be discussed more fully hereinbelow. A caster **60** of the conventional variety is attached to platform **36** by means of wheel block **62** to support the platform when the cart **10** is in the upright or vertical position shown in FIG. **4**.

A pair of wheels **43** are placed on both sides of angle bracket **34** and rotatably mounted on an axle **42** which is supported from angle bracket **34** by means not shown. An antiskid lever **45** having a perpendicularly-related tongue member **47**, rotatably mounted on axle **42** axially adjacent one of the wheels **43**, is provided for braking the wheel **43** associated therewith when the cart **10** is in the horizontal position shown in FIG. **1**. That is, when the lever **45** is placed in a position so that its tongue member **47** is wedged between the wheel surface with which the lever is associated and the floor, the wheel will be effectively braked, and the cart **10** may then be readily lifted or levered into the vertical position shown in FIG. **4** without fear of wheels **43** rolling.

An L-shaped member **38** is attached to angle bracket **34** with an arm of the L extending parallel to and slightly beneath the frame members **12**, when viewing the cart **10** as in FIG. **1**. This member **38** is provided for supporting an empty roll **80** in the manner shown in FIG. **4** so that such an empty roll is readily available for installation in a loom after the filled cloth roll is removed. The empty roll **80** is further secured to the cart **10** by means of handles **46** and **48** attached to frame members **12** substantially at the centers thereof. The handles **46** and **48** are used also as a means for manually pushing the cart in the upright position shown in FIG. **4**. The handle **46** is designed to be stationary and is fixedly secured to frame member **12***a*. The handle **48**, however, is spring loaded so that the inward portion of the handle may be moved away from frame member **12***b* allowing the roll **80** to be removed from the cart. As best shown in FIG. **3**, handle **48** is attached to frame member **12***b* by means of a bolt **81** having a compression spring **83** interposed between the bolt **81** and the nut **82**. Thus, the spring **83** tends to hold handle **48** in against frame member **12***b* but it may be manually pushed rearwardly to allow removal of the roll **80**.

At a point on frame members **12***a* and **12***b* slightly above handles **46** and **48** are attached wheel blocks **26** and **22**, respectively, having rotatably secured thereto wheels **27** and **24**, respectively. The wheels **24** and **27** allow the cart **10** to be readily manipulated by handle **32** when the cart is in the horizontal position shown in FIG. **1**.

A pair of stationary arcuate-shaped arms are spaced along the length of frame member **12***b*. These arm members **18** and **20**, respectively, are fixedly attached to frame member **12**b by any well-known means, such as welding, at points **19** and **23**. The arm members **18** and **20** have portions **17** and **21**, respectively, along their arcuate length which extend across the space between frame members **12***a* and **12***b*, as best shown in FIG. **4**. The portions **17** and **21** provide support for the filled cloth roll placed on the cart between frame members **12***a* and **12***b* when the cart is in the horizontal position shown in FIG. **1**.

A pair of rotatable, arcuate shaped arms **14** and **16** are spaced along the length of frame member **12***a* and are adjacent the arms **18** and **20**, respectively. The arms **14** and **16** are rotatably mounted, in a manner to be described below, on a pickup rod **30** which is rotatably mounted on frame member **12***a* by means of frame bearing blocks **28**. The rod **30** is adapted to be rotated in either a clockwise or counterclockwise direction. At the end thereof adjacent handle **32**, the rod **30** is bent in substantially a 90° angle to form pickup rod handle **31**, and the end of angle **31** is broken to form a rotatable portion **29** for manipulating the pickup rod **30**. The arm **16** is mounted by any convenient means firmly to the pickup rod **30** so that this arm will rotate 90° in both directions when the pickup rod **30** is so rotated. The arm **14** is, however, rotatably mounted on pickup rod **30** in such a way that the arm **14** will not follow pickup rod **30** when it is rotated in a clockwise direction, but it may be freely manually rotated in that direction about the rod, said direction being taken as it would appear to one facing handle **32** and the length of the cart. The arm **14** is attached to the pickup rod **30** by a positive drive mechanism **72** so that when the handle **30** is rotated in the counterclockwise direction the arm **14** will follow the motion of the pickup rod. It is to be noted that when the arms **14** and **16** are at rest in the fully counterclockwise position, they extend upwardly from a horizontally placed cart **10** in a manner similar to arms **18** and **20**. When the arms **14** and **16** are rotated fully in the clockwise direction they extend outwardly, laterally of frame member **12***a*.

An angle bracket **62** is mounted on wheel block **22** and has attached to the upwardly extending portion thereof strap **64**, which is made of rubber in the preferred embodiment, and which is adapted to secure the filled cloth roll on the cart. The strap **64** extends across the width of the cart between frame members **12***a* and **12***b* and has at its end an eyelet **66** adapted to be placed around a peg **68** attached to an angle bracket **67** extending upwardly from wheel block **26**.

The frame members, arms, angle brackets, handles and the like described hereinabove are all preferably fabricated in the well-known manner from lightweight metallic materials to enhance the ease of manipulation of the cart.

In order to more clearly understand the functions of the various movable parts, particularly the arms **14** and **16**, on the doffing cart **10** and in order to more clearly understand how doffing cart **10** is used to remove a filled cloth roll from a loom reference will now be made to FIGS. **10***a–j* which are diagrammatic illustrations of the various positions of the cart and the arms illustrating the use of the cart for filled cloth roll removal. In each of these Figures like elements are indicated by like numerals and correspond to numerals used in FIGS. **1–4**. In FIG. **10***a* the doffing cart **10** is shown as having been placed in the narrow aisle between looms **92***a* and **92***b*. The doffing cart is in the horizontal position as shown in FIG. **1**, and it will be used to remove a filled cloth roll **90** from loom **92**a. In this position doffing cart **10** is manipulated by operator **88** at the handle of the doffing cart **32** to be placed under the loom **92***a* as close to the roll of cloth **90** as possible. It is to be noted that an empty roll **84** is in place on the doffing cart **10**, as shown in FIG. **4**.

In FIG. **10**b the doffing cart **10** has been manipulated by the operator so that the end thereof adjacent platform **36** is under loom **92***a* and under and end of filled cloth roll **90**.

FIG. **10***c* illustrates the doffing cart **10** as being in the same position as in FIG. **10***b*, but at this point the operator has turned handle **31** and pickup rod **30** through an angle of 90° in a clockwise direction, the direction being as seen by the operator **88** facing handle **32**. In so rotating the pickup rod **30** movable arm **16** is rotated so that it is in an outstretched position extending laterally from cart **10** beneath roll **90**. The movable arm **14**, because of the mode of connection described above, will remain in an upright position.

FIG. **10***d* illustrates arm **16** of doffing cart **10** being in the same position as in FIG. **10***c*. In this figure, however, the operator has moved the doffing cart inwardly under loom **92***a* so that the arm **16** is more fully under the filled cloth roll **90**. It is to be noted, as mentioned above, that the doffing cart **10** is made of very light weight materials so that it can readily be moved under the loom by means of manipulation of handle **32**.

FIG. **10***e* illustrates the doffing cart **10** being in the same position as in FIG. **10***d*, but in this figure the operator has manually rotated movable arm **14** through an angle of substantially 90° in a clockwise direction so that arm **14** is directly underneath the end of cloth roll **90** remote from the end beneath which arm **16** has been placed.

FIG. **10**f illustrates the arms **14** and **16** of doffing cart **10** as being in the same position as in FIG. **10***e*. In this figure, however, the end of doffing cart **10** adjacent arm **14** is moved by the operator so that it is beneath roll **90** to a greater degree.

When the doffing cart **10** is under the roll **90** in the manner shown in FIG. **10***g* so that both the arms **14** and **16** and a sub-

stantial portion of the width of the cart are beneath the roll **90**, the operator may then disengage the end of roll **90** adjacent arm **14** from the loom. The end of roll **90** adjacent arm **14** is then allowed to merely drop down onto cart **10** so that it rests on arm **14**. The end of roll **90** adjacent arm **16** remains engaged to the loom.

In FIG. **10***h* the end of roll **90** adjacent arm **14** is shown as resting on the arm, and the cart **10** has been moved so the end of the cart adjacent handle **32** is pulled outwardly away from the loom. That is, the cart is manipulated to be at an angle with the loom so that only that end of the roll resting an arm **14** is brought out from under the loom.

As shown in FIG. **10***i*, with an end of the filled cloth roll **90** resting on arm **14**, the operator will pull the cart and cloth roll toward him, and the end of the cloth roll adjacent arm **16** will be disengaged from the loom by this pulling action and will fall onto arm **16**. While the cloth roll **90** is resting on arms **14** and **16**, the doffing cart **10** should be manipulated so that it is entirely out from under the loom **92***a*.

In FIG. **10***j* the arms **14** and **16** have been rotated in a counterclockwise direction by rotating handle **31** of pickup rod **30**. The movement of arms **14** and **16** in the above-described manner moves the roll onto the doffing cart **10** so that it rests thereon on portions **17** and **21** of fixed arms **18** and **20**, respectively (see FIG. **4**). The fixed arms **18** and **20**, while roll **90** is being moved by arms **14** and **16**, act as barriers preventing the filled cloth roll **90** from rolling off doffing cart **10** on the side thereof away from the loom from which the filled roll was removed. When the filled cloth roll **90** is resting on doffing cart **10**, the holding strap **64** may be placed across the roll and attached to the pin **68** thereby firmly securing the roll to the cart.

With antiskid lever **45** in place so that tongue **47** thereof is wedged between wheel **43** and the floor upon which the cart is resting the doffing cart may be lifted or levered into an upright position, this position being shown in FIG. **4**. With the cart in this position an end of filled cloth roll **90** will rest on the floor surface **40** of channel-shaped platform **36**. Any tendency of the roll to fall forwardly is resisted by the attached strap **64**. Having lifted the doffing cart **10** to its upright position with the filled cloth roll secured thereon the operator may then remove the empty roll **84** from its place on the cart on roll support **38** by pulling handle **48** rearwardly and install the empty roll **84** in the loom.

FIGS. **5** and **6** illustrate, in end and top elevations, respectively, the structural details of a first preferred embodiment of a receiving cart constricted according to the principles of this invention. In these two figures like elements are indicated by like numerals.

The receiving cart, generally indicated as **100**, is adapted to receive a plurality of filled cloth rolls from the doffing cart **10** in a manner to be described hereinbelow and to store said filled cloth rolls in a vertical or upright position. Further, along the rear side thereof, the receiving cart **100** is adapted to store a number of empty rolls for installation on the looms from which filled cloth rolls have been removed.

The receiving cart **100** includes floor braces **101** upon which a surface **102** has been placed. Beneath floor surface **102** and centrally disposed on the front and rear sides of the cart **100** wheel blocks **108** have been mounted from which depend the wheels **107**. Centrally of the ends of the cart, casters **109** have been mounted allowing the cart to be readily maneuverable. A truck lock **132** is mounted at one end of the receiving cart **100** and is operable by a handle **133** to lock the cart in place, as needed. Rubber bumpers **104** are mounted on the four corners of the cart as formed by the floor brace members **101**. A coupling bar **106** is mounted along the front side edge of the floor **102** of the cart. This bar is fixedly attached to that edge and is extended outwardly therefrom by spacers **107**. The function of coupling bar **106** will be discussed more fully hereinbelow.

In order to store the filled cloth rolls, as well as the empty rolls, in an upright position an upright frame structure is provided which extends around the periphery of the cart **100**, but is open at the front side thereof adjacent coupling bar **106** to allow filled rolls to be placed in the cart. This frame structure is formed by a pair of upright members **112** placed at the front corners of the cart adjacent coupling bar **106**. An additional front upright member **112** is centrally placed along the front side of the cart **100** to divide same into two sections. Rear upright members **114** are placed along the rear edge of the cart in positions corresponding to the positioning of the front upright members **112**. The front upright members **112** are interconnected with the corresponding rear upright members **114** by means of top cross members **110** which extend between the top ends of the aforementioned upright members. In addition the rear upright members **114** support a rear barrier frame structure generally indicated as **122**. A second barrier structure **120** is placed inwardly from rear barrier structure **122** by means of brace **144**. As best shown in FIG. **5**, the ends of the receiving cart are open to allow the empty rolls **140** to be readily removed from or placed in the space defined between barrier structures **120** and **122**. Additional cross members **116**, **118** and **130** are provided for additional lateral structure support between upright members **112** and **114**. Again, it must be remembered that there is no frame structure extending between the upright members **112** allowing the front portion of the receiving cart to remain open for placing filled cloth rolls therein.

In order to understand how a doffing cart **10** will cooperate with receiving cart **100** in order to transfer the filled cloth roll from the doffing cart to the receiving cart a portion of a doffing cart is shown in dotted line in FIG. **6** and indicated with the numeral **10**. It will be remembered from the description of the structural details of the doffing cart **10** in FIGS. **1–4** that the bight portion of the channel-shaped platform **36** extended forwardly from the remainder of the platform then was bent downwardly to form a tongue **37**. When a filled cloth roll has been placed on doffing cart **10** and the cart levered into the upright position shown in FIG. **4**, the doffing cart **10** may be pushed by means of handles **46** and **48** to the position of the receiving cart **100**. The turned-down tongue **37** of doffing cart **10** will fit in the space between coupling bar **106** and the front side floor brace member **101** on cart **100**. The floor portion **40** of platform **46** on doffing cart **10** is sloped slightly forwardly toward tongue **37**, and the floor surface **102** in cart **100** also slopes slightly downwardly rearwardly away from coupling bar **106**. Further, these floor surfaces are made of friction resistant material so that the filled cloth roll may be readily slid in the vertical position from cart **10** to cart **100**. The wheel structure of cart **10** is designed so that the floor surface of platform member **36** will be of a height from the floor substantially equal to the height of the floor surface in the cart **100** from the loom room floor. Further, in coupling the doffing cart to the receiving cart the floor surface **40** will be placed substantially flush with the floor surface **102** by means of a coupling action of tongue **37** and coupling bar **106**.

As the receiving cart **100** is filled with cloth rolls, it may be manually moved from position to position ad desired by means of handles **126** placed on each of the opposing ends thereof. The truck lock **132** will allow the cart **100** to be locked in a given position by means of a foot operation of handle **133** in the well-known manner.

FIGS. **7** and **8** illustrate the structural details of a second preferred embodiment of a receiving cart adapted to receive filled cloth rolls from a doffing cart **10**. The receiving cart **200** is adapted to have the filled cloth roll **90** loaded therein from either side thereof. Means are provided for having a plurality of empty rolls **140** stored centrally in the cart in horizontally extending positions and in a vertically stacked relationship.

The cart **100** includes a floor formed by support members **202** and a surface member **204**. Wheels **208** are attached in any well-known manner to the four corners of the cart **200** allowing it to move along the area where it is to receive filled cloth rolls. The cart **200** is designed to be drawn by motive power, e.g., a power truck, so that eyelets **210** are provided on

both ends of the cart and are attached to the floor support member **202**.

The end frame structures of the cart **200** are formed by continuous, U-shaped members **214** placed at both ends of the cart. The ends of the U in each member **214** are attached to opposite front and rear corners at a given end of the floor structure **202**. Three front upright members **216** are spaced along the length of the cart **200** substantially centrally of its width, two of the members **216** being adjacent, attached to and providing vertical support for end members **214** and the other of the members **216** being located centrally along the length of the cart. Three rear upright members **218** are placed in corresponding positions along the length of the cart, but they are spaced from members **216** a distance slightly greater than the width of an empty roll **140**. The upright members **216** are interconnected laterally by at least one cross member **220** which also provides lateral support for the end members **214**. The upright members **218** are interconnected by a cross member **221**. Within and across the space between uprights **216** and **218** shelf members **222** are attached. These members **222** may have an arcuate shape to accommodate the empty rolls **140**, and they are placed above one another a height to allow the empty rolls to be accommodated. Thus, as best shown in FIG. **8**, the empty rolls **140** may be readily slid in and out horizontally from the ends of cart **200**.

As discussed hereinabove, the filled cloth rolls **90** are stored on either side of the cart **200** and may be placed therein from either side, as shown in FIG. **7**. A number of pairs of straps **224**, attached to cross members **220** and **221** are provided for the filled cloth rolls, one pair fitting around each roll. The straps **224** are attached to each of the cross braces **220** and **221** by plates **226** which are bolted thereon. An end of one of the straps of each pair **224** is equipped with an eyelet **225**, and an end of the other strap of each pair is equipped with a hook **227** so that a pair of the straps **224** may be secured around the filled cloth roll **90**.

Referring to FIG. **9**, in order to move a filled cloth roll **90** from a doffing cart **10** to the receiving cart **200** the tongue **37** of the doffing cart **10** is placed in the space between the coupling bar **212**, which is bolted to and spaced the appropriate distance, as determined by the thickness of tongue **37**, from floor member **202**. This places the surface **40** in the doffing cart **10** substantially adjacent the floor surface **204** in the receiving cart **200** so that the filled cloth roll **90** may readily be slid therein. When the filled cloth roll **90** has been placed in the receiving cart **200** it is secured therein by means of straps **224**.

It may be seen from the description of the preferred embodiments given hereinabove that the objects set forth above may readily be achieved by utilizing the invention defined herein by the claims. In addition it is to be remembered that the description of the preferred embodiments given hereinabove is only exemplary and that modifications may be made to the described structural elements or their structural arrangement within the scope of the appended claims.

What is claimed is:

1. An assembly for removing filled cloth rolls from looms and for transporting said removed cloth rolls comprising

first cart means for directly receiving and having secured thereto a horizontally removable cloth roll received from a loom, said first cart means including

receiving means for receiving said horizontally removable cloth roll detached from a loom and for mechanically placing said cloth roll on said first cart means in a horizontally extending position when said first cart means is in a first position, and levering means for manual movement of said first cart means into a second position in which said filled cloth roll extends vertically and in which said first cart can transport said filled cloth roll away from said loom, thereby providing for means to transport said cloth roll away from the loom from which it was received,

second cart means for receiving and storing a plurality of said filled cloth rolls, said second cart means being adapted to transport said plurality of cloth rolls and

coupling means for releasably attaching said first cart means to said second cart means in a manner permitting a filled cloth roll to be transferred without manual lifting from said first cart means to said second cart means.

2. The assembly defined in claim **1** wherein said first cart means includes means for storing an empty cloth roll adapted to be attached to a loom.

3. The assembly defined in claim **1** wherein said receiving means comprises at least a pair of arms placed on opposite sides of said first cart and shaped to laterally restrain thereon a filled cloth roll resting on said first cart, one of said arms being rotatably in a first direction to extend beneath a horizontally extending cloth roll on a loom as to allow said cloth roll to rest thereon when detached from said loom and rotatable in a second direction to lift said cloth roll onto said cart, the other of said arms being stationary to form a barrier to prevent said cloth roll from rolling from said first cart means when lifted thereon.

4. The assembly defined in claim **3** wherein said receiving means further includes a manually rotatable shaft for rotating said one arm.

5. The assembly defined in claim **4** wherein said first cart means has a plurality of pairs of said arms mounted thereon as to be spaced along the length of a filled cloth roll placed on said first cart,

the rotatable one of at least a first pair of said arms being attached to said shaft as to rotate with said shaft in said first and second directions and

the rotatable one of at least a second pair of said arms being attached to said shaft as to remain extending in said laterally restraining position when said shaft is rotated in said first direction, said one arm being adapted to be manually rotatably about said shaft in said first direction and rotatably with said shaft in second direction.

6. The assembly defined in claim **1** wherein said coupling means comprises a tongue member extending from one of said first and second carts and a channel member on the other of said first and second carts adapted to receive said tongue member.

7. The assembly defined in claim **1** wherein said second cart means includes means for storing a plurality of filled cloth rolls in a vertical position therein.

8. The assembly defined in claim **9** wherein said second cart means further includes means for storing a plurality of empty rolls for installation in a loom from which filled cloth rolls have been removed.

* * * * *

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,650,419 Dated March 21, 1972

Inventor(s) Littleton Upshur; Burton P. Franklin; Asa E. Roane and Kenneth Y. Wang

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

Column 6, line 70, the number "100" should be --200--.

Column 6, line 58, "ad" should be --as--.

Signed and sealed this 12th day of September 1972.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents

FORM PO-1050 (10-69)

USCOMM-DC 60376-P69
* U.S. GOVERNMENT PRINTING OFFICE : 1969 O—366-334