June 17, 1969 N. A WALSH 3,450,288

LOAD HANDLING ATTACHMENT FOR HYDRAULIC LIFTS

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Fig. 1

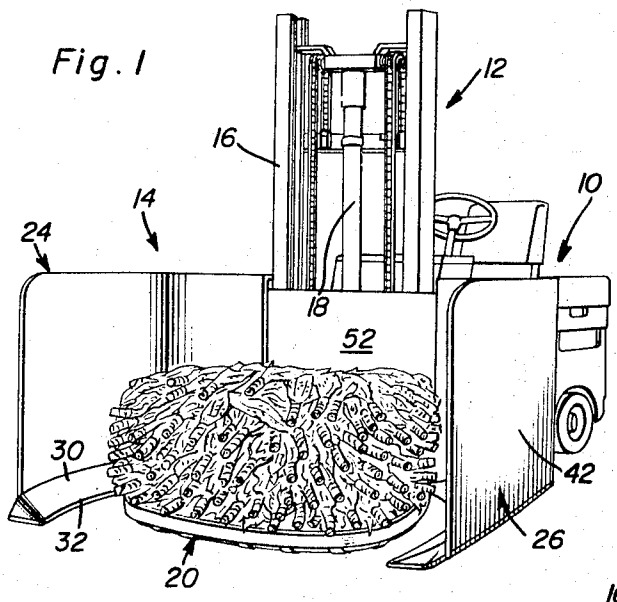



Fig. 8

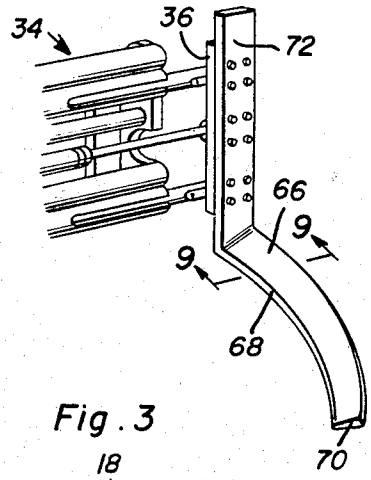



Fig. 3

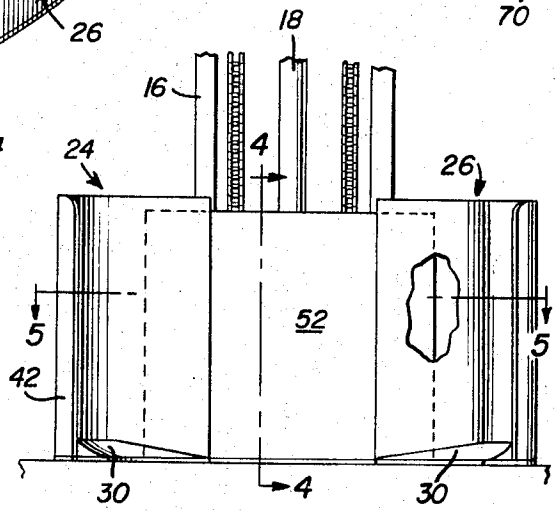



Fig. 2

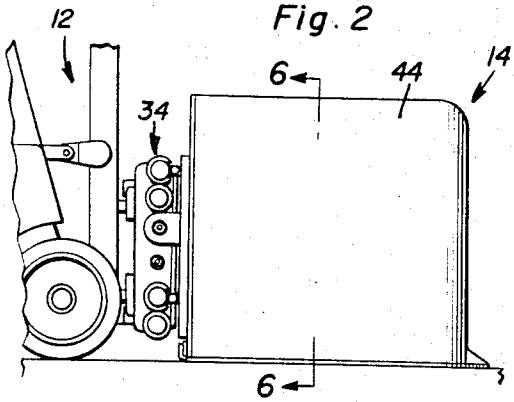



Fig. 4

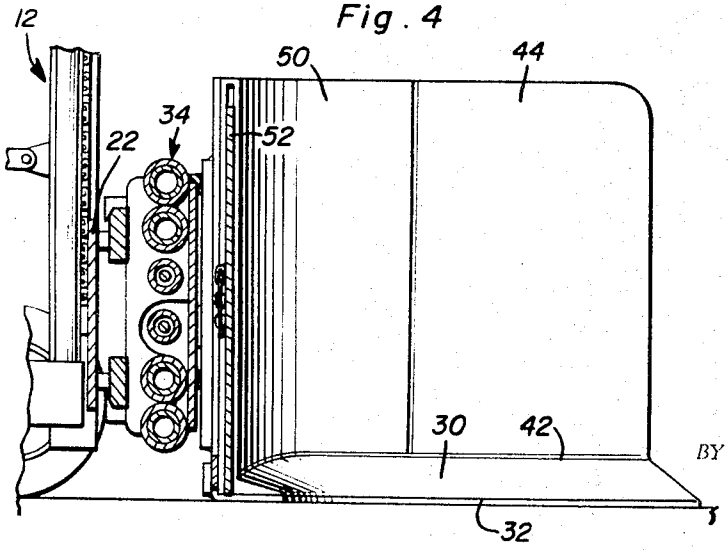
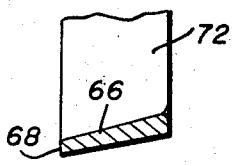



Fig. 9




Namon A. Walsh

INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson

Attorneys

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Fig. 5

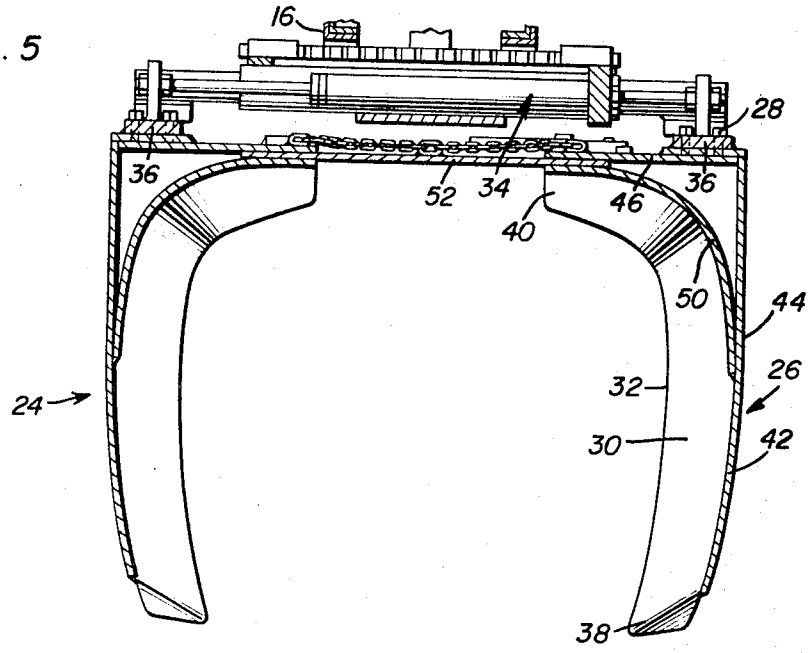



Fig. 6

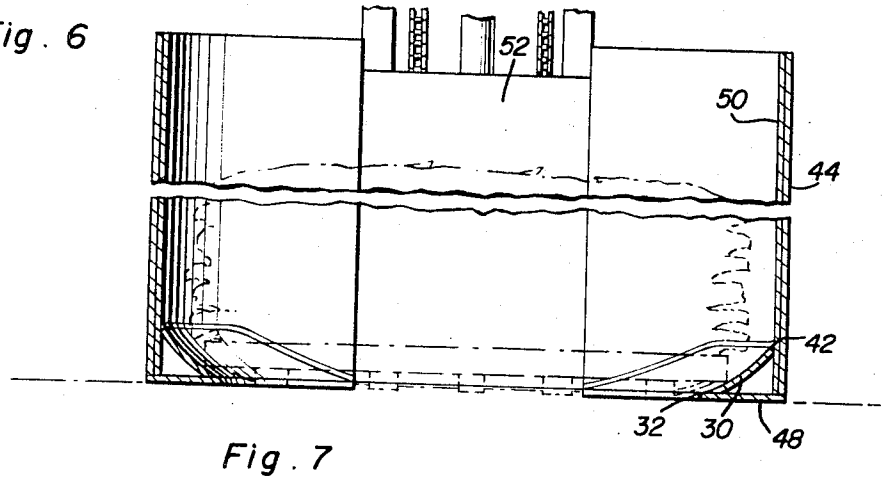
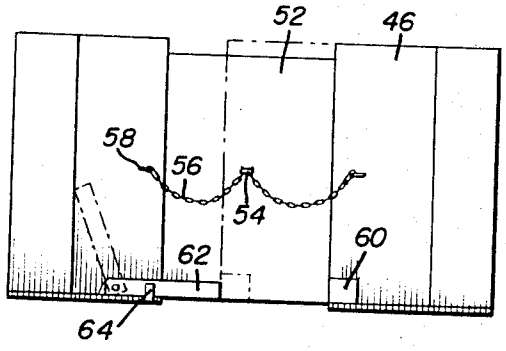



Fig. 7




Namon A. Walsh

INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson

Attorneys

United States Patent Office 3,450,288
Patented June 17, 1969



3,450,288

# LOAD HANDLING ATTACHMENT FOR HYDRAULIC LIFTS

Namon A. Walsh, Rte. 4, Roxboro, N.C. 27573

Filed June 16, 1966, Ser. No. 557,999
Int. Cl. B66f 9/18, 9/14
U.S. Cl. 214—731 9 Claims

## ABSTRACT OF THE DISCLOSURE

Special attachments replacing the usual load engaging forks on an industrial truck are contoured for engagement with tobacco loaded baskets to elevate the same off the floor without damage or spillage. The attachments include curved arms having upper, downwardly inclined supporting surfaces movable relative to each other in a horizontal plane and vertically together.

This invention relates to a special load handling attachment for industrial trucks having power operated lift and clamping facilities. More particularly, the invention is concerned with the handling of loads usually encountered in the tobacco industry such as baskets of tobacco leaves and sheeted bundles of tobacco.

Although various load engaging facilities have heretofore been devised for attachment to the power operated lifts and clamping assemblies associated with industrial trucks, they are not suitable for the types of loads with which the present invention is concerned. The load engaging attachments of the present invention are particularly designed therefore to support a load in such a manner as to avoid damage thereto as well as to raise loads from the ground and deposit them in piles.

In accordance with the foregoing objectives of the present invention, the load engaging attachments include forwardly extending arms mounted in laterally spaced relation to each other by the hydraulic clamping assembly and spaced therebelow so that the confronting inner edges of the arms may be vertically displaced into engagement with the ground and be moved laterally toward each other along the ground in order to engage and support a load therebetween. The arms are therefore laterally inclined and contoured or curved so as to accommodate reception of the particular load and support thereof above the ground with a minimum amount of lateral or longitudinal shifting.

Despite the special care required in connection with the handling of tobacco leaves, the load engaging attachment of the present invention is capable of meeting the problem with power operated equipment so as to eliminate the need for a substantial amount of manual labor. Further, in addition to the savings in labor costs, the load engaging attachments of the present invention will considerably reduce handling time.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a perspective view showing the load handling attachment of the present invention installed.

FIGURE 2 is a side elevational view of the attachment shown in FIGURE 1.

FIGURE 3 is a front elevational view of the attachment.

FIGURE 4 is an enlarged sectional view taken substantially through a plane indicated by section line 4—4 in FIGURE 3.

FIGURE 5 is an enlarged sectional view taken substantially through a plane indicated by section line 5—5 in FIGURE 3.



FIGURE 6 is a sectional view taken substantially through a plane indicated by section line 6—6 of FIGURE 2.

FIGURE 7 is a rear elevational view of the attachment.

FIGURE 8 is a partial perspective view showing a modified form of attachment.

FIGURE 9 is an enlarged partial sectional view taken substantially through a plane indicated by section line 9—9 in FIGURE 8.

Referring now to the drawings in detail, reference numeral **10** generally denotes in FIGURE 1 a commercially available type of industrial truck mounting a forward mast structure **12** through which the load handling attachment generally referred to by reference numeral **14** is vertically moved. The mast structure is of a well-known type and includes a pair of parallel vertical guide rails **16** between which a hydraulic piston motor **18** is located for elevating or lowering a load such as the basket of tobacco leaves **20** shown in FIGURE 1.

As shown in FIGURES 2, 4 and 5, a vertically movable carriage **22** is mounted by the mast structure **12** forwardly of the truck **10**. The carriage **32** mounts a hydraulic clamp assembly **34** having laterally spaced mounting bases **36** which are displaceable relative to each other by the hydraulic power operating facilities associated with the clamp assembly. It will therefore be apparent that a load engaged by the attachment **14** may be vertically displaced and tilted forwardly or rearwardly by means of the mast structure while operation of the clamp assembly will be operative to both engage and release the load under control of the operator of the truck. Since the structural and operating details associated with the mast structure and the clamp assembly are well known and form no part of the present invention, further description thereof is deemed unnecessary.

As shown in FIGURES 1 through 7, the attachment **14** consists of two load engaging sections **24** and **26** which are laterally displaceable toward or away from each other by means of the hydraulic clamp assembly **34** to which they are connected. Each section is therefore secured by suitable means such as the fasteners **28** to the mounting bases **36** associated with the clamp assembly. Further, it will be noted that the load engaging sections **24** and **26** extend below the clamp assembly **34** so that it may be vertically displaced into engagement with the ground in order to pick up a load such as the load **20** as shown in FIGURE 1.

As more clearly seen in FIGURES 4, 5 and 6, each load engaging section is a mirror image of the other and includes a forwardly extending, elongated arm **30**. The arm includes an inner edge **32** which extends from a forward end portion **38** to a rear end portion **40**. The forward edge **32** is provided with a special contour or curvature for accommodating the particular loads to be handled, this curvature being such as to facilitate engagement of the load lying on the ground with little likelihood of damaging the tobacco leaves. It will be noted therefore, that the arms **30** curve toward each other adjacent the rear end portions **40** and also curve slightly toward each other adjacent the forward end portions **38**. Also, in order to engage the load and minimize shifting of the load either laterally or forwardly and rearwardly once it is supported, the arms **30** are laterally inclined at a substantially constant angle along the curved length of the inner edge **32**. Accordingly, the arms **32** are fixedly positioned so that the laterally outer edges **42** thereof are spaced above the inner confronting edges **32**.

The load engaging arm **30** of each section **24** and **26** is fixedly mounted as aforementioned by means of a

mounting structure which includes a vertical side wall **44** secured along a rear vertical edge thereof to a laterally extending rear wall **46** to which the mounting base **36** is connected by fasteners **28**. A horizontal base plate **48** is secured to the lower edges of the side and rear walls **44** and **46** and underlies the load engaging arm **30** as more clearly seen in FIGURE 6. The inner edge **32** of the arm **30** may therefore be welded to the base plate **48** while the outer edge **42** of the arm is welded to the side wall **44** and to a curved corner connecting wall **50**. The connecting wall **50** is therefore also welded along its forward vertical edge to the side wall and is spaced from the rear wall **46** at its rear vertical edge so that a panel **52** may be slidably mounted between the rear walls and the connecting walls.

The panel **52** bridges the rear end portions **40** of the load engaging arms **30** and may thereby provide an abutment against which certain types of loads are engaged. The panel **52** also cooperates to limit laterally outward movement of the load engaging sections **24** and **26** relative to each other. Toward this end, the rear side of the panel **52** is provided with an anchor **54** to which the flexible chains **56** are connected, the ends of the chains also being secured by anchors **58** to the rear sides of the rear walls **46** as more clearly seen in FIGURE 7. Also, in order to limit lateral inward movement of the load engaging sections toward each other, one of the rear walls is provided with an abutment **60** adjacent its lower edge adapted to be engaged by a stop bar **62** pivotally mounted on the other rear wall. Thus, when the bar **62** is displaced from its dotted line position shown in FIGURE 7 to the solid line position, it will be held against the rear wall by means of the guide element **64** and engage the abutment **60** when the load engaging sections are laterally displaced by the clamp assembly to an inner limit position, the opposite outer limit position being determined by the length of the flexible chains **56**.

It will be apparent that the vertical walls associated with the load engaging sections will confine the load therebetween which is engaged and supported by the arms **30** as aforementioned. The load engaging sections may be laterally displaced away from each other as limited by the flexible chains **56** in order to release the load after it has been positioned at any desired location whether it be on the ground or on top of some other load. It will also be necessary to limit the laterally inward movement of the load engaging sections toward each other as hereinbefore described when engaging loads such as the basket load **20** shown in FIGURE 1. However, for other types of loads such as sheeted tobacco leaves, it may be desirable to move the load engaging sections closer toward each other than permitted by the stop elements **60** and **62**. In such case, the panel **52** is removed and the stop bar **62** pivoted to the dotted line position shown in FIGURE 7. Accordingly, laterally inward movement will then be limited by abutment between the rear walls **46**.

FIGURES 8 and 9 show another form of load engaging attachment wherein load engaging arms **66** are provided, these arms serving functions similar to those described in connection with the arms **30** of FIGURES 1 through 7. Accordingly, each of the arms **66** includes a curved inner edge **68** extending from a forward end portion **70** and engageable with the ground. The arms **66** are also formed integral with a mounting extension **72** secured in any suitable fashion to the mounting base **36** of the clamp assembly **34**. The arms **66** are thereby fixedly positioned so that they are laterally inclined for facilitated engagement with the load as hereinbefore described in connection with the arms **30**.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described.



I claim:

**1.** In combination with a lift truck having a vertically driven carriage and a power operated clamp assembly, a pair of load engaging sections mounted by the clamp assembly for vertical movement relative to the ground and lateral movement relative to each other, each of said load engaging sections including an elongated arm extending forwardly from the truck and means rigidly mounting said arms in laterally inclined positions fixedly spaced below the clamp assembly, said elongated arms including confronting inner edges and laterally outer edges spaced above the confronting inner edges to prevent lateral shifting of a load supported between the arms, said edges of the arms being curved toward each other at forward and rear end portions of the arms to prevent shifting of the load forwardly and rearwardly thereof, said mounting means comprising laterally spaced vertical side walls, rear walls secured to the side walls, corner connecting walls secured to the side walls in spaced relation to the rear walls, and horizontal base plates secured to the side walls and the rear walls below the elongated arms, said elongated arms being secured to the side walls, corner connecting walls and the base plates.

**2.** The combination of claim **1** including a panel slidably received between the rear walls and the corner walls bridging the elongated arms.

**3.** The combination of claim **2** including stop means mounted by the mounting means for limiting lateral movement of the elongated arms relative to each other.

**4.** The combination of claim **3** wherein said stop means includes an abutment element mounted on one of said rear walls, a stop bar pivotally mounted by the other of the walls for displacement into the path of movement of the abutment element and flexible means anchored to the panel and connected to the rear walls for limiting lateral movement outwardly from the panel.

**5.** In combination with a lift truck having a vertically driven carriage and a power operated clamp assembly, a pair of load engaging sections mounted by the clamp assembly for vertical movement relative to the ground and lateral movement relative to each other, each of said load engaging sections including an elongated arm extending forwardly from the truck and means rigidly mounting said arms in laterally inclined position fixedly spaced below the clamp assembly, said mounting means comprising laterally spaced vertical side walls, rear walls secured to the side walls, corner connecting walls secured to the side walls in spaced relation to the rear walls, and horizontal base plates secured to the side walls and the rear walls below the elongated arms, said elongated arms being secured to the side walls, corner connecting walls and the base plates.

**6.** The combination of claim **5** including a panel slidably received between the rear walls and the corner walls bridging the elongated arms.

**7.** The combination of claim **6** wherein said stop means includes an abutment element mounted on one of said rear walls, a stop bar pivotally mounted by the other of the walls for displacement into the path of movement of the abutment element and flexible means anchored to the panel and connected to the rear walls for limiting lateral movement outwardly from the panel.

**8.** In combination with a lift struck having a vertically driven carriage and a power operated clamp assembly, a pair of load engaging sections mounted by the clamp assembly for vertical movement relative to the ground and lateral movement relative to each other, each of said load engaging sections including an elongated arm extending forwardly from the truck, laterally spaced vertical side walls, rear walls secured to the side walls, corner connecting walls secured to the side walls in spaced relation to the rear walls, and horizontal base plates secured to the side walls and the rear walls below the elongated arms, said elongated arms being secured to the side walls, corner connecting walls and the base plates.

9. The combination of claim 8 including a panel slidably received between the rear walls and the corner walls bridging the elongated arms.


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GERALD M. FORLENZA, *Primary Examiner.*

F. E. WERNER, *Assistant Examiner.*

U.S. Cl. X.R.

214—653