Aug. 22, 1933. M. FIRL 1,923,816

ADJUSTABLE HOLDER FOR GRAIN AND THE LIKE BAGS OR SACKS

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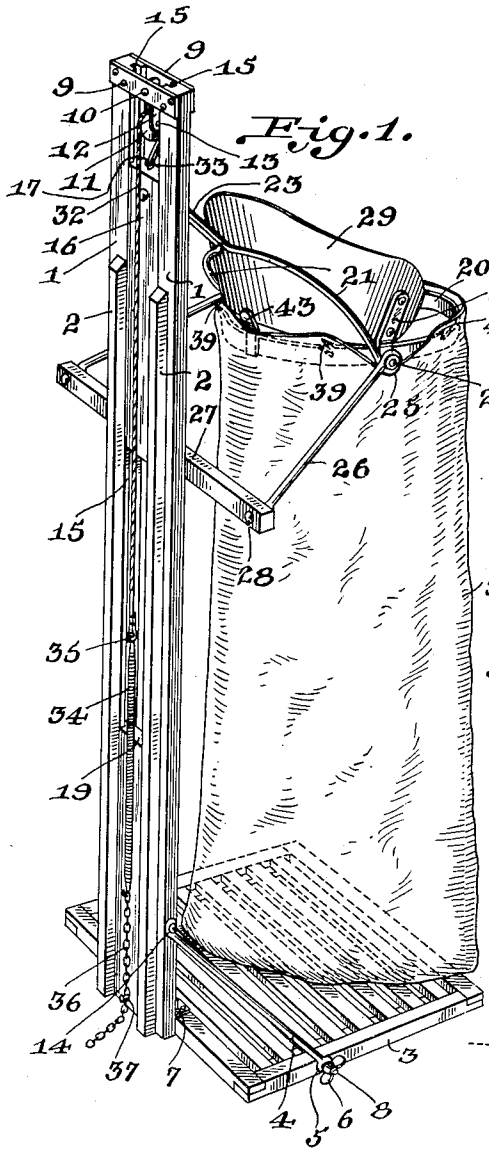


Fig. 1.

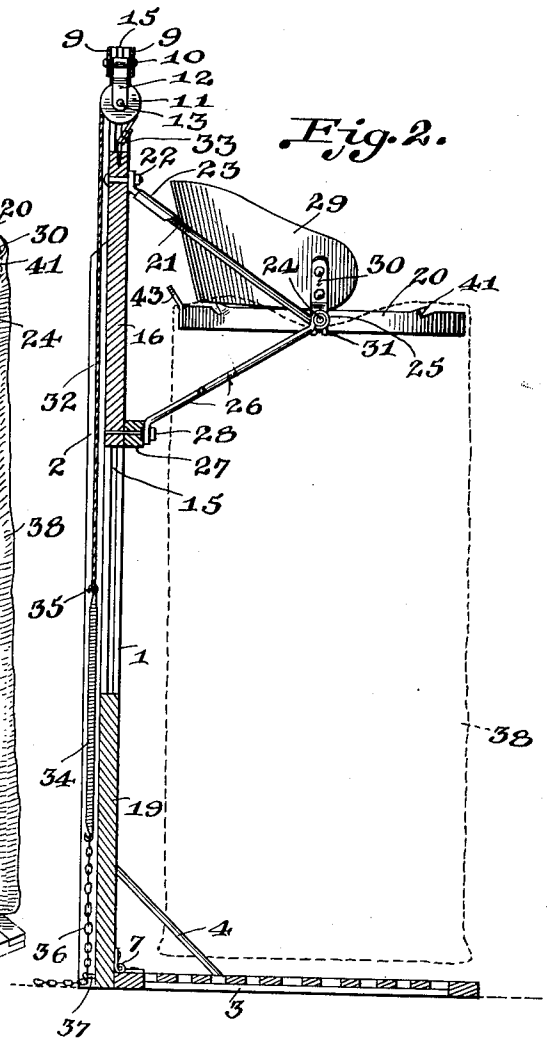


Fig. 2.

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Fig. 3.

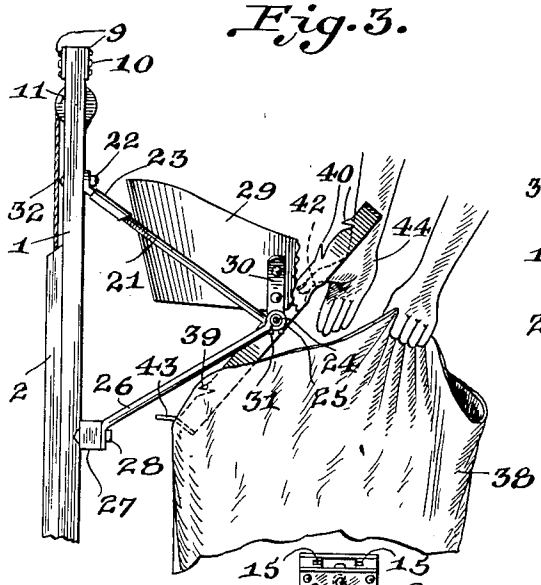


Fig. 4.

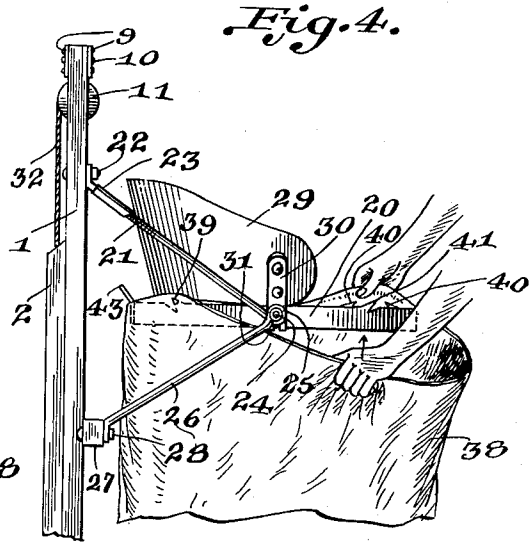


Fig. 5.

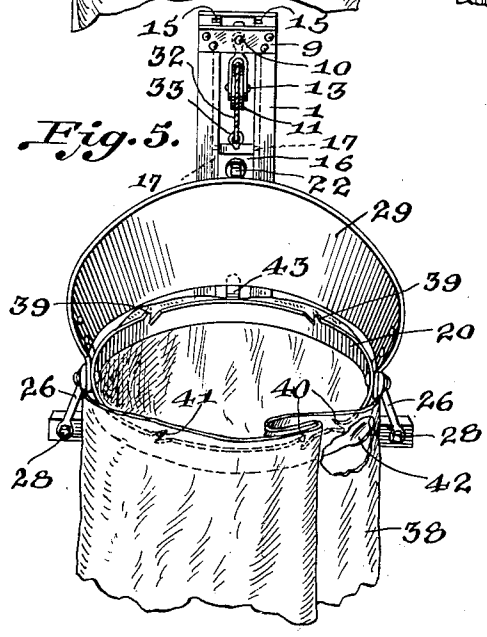
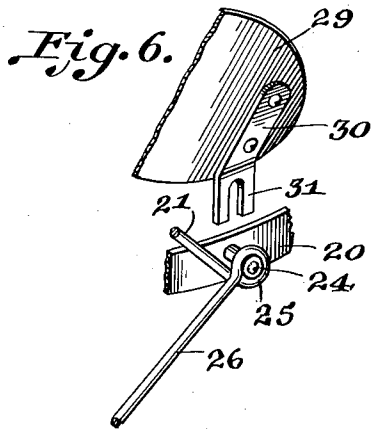


Fig. 6.



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Patented Aug. 22, 1933 1,923,816

UNITED STATES PATENT OFFICE

1,923,816

ADJUSTABLE HOLDER FOR GRAIN AND THE LIKE BAGS OR SACKS

Milton Firl, Meyersdale, Pa.

Application December 6, 1930. Serial No. 500,619

6 Claims. (Cl. 83—26)

This invention relates to certain improvements in adjustable holders for grain and the like bags or sacks; and the nature and objects of the invention will be readily recognized and understood by those skilled in the art from the following explanation and detailed description of the accompanying drawings illustrating what I at present consider to be the preferred embodiment or mechanical expression of my invention from among various other forms, arrangements, combinations and constructions of which the invention is capable within the spirit and the scope thereof.

In filling bags or sacks with grain or other bulk materials, in order to properly and efficiently fill such a bag it is essential that the bag be held during the filling operation, in fully extended vertically disposed position against collapse or folding, wrinkling or creasing of the bag side walls and with the open upper end or mouth of the bag maintained in substantially maximum opened position to insure a sufficiently large filling opening for the discharge of material into the bag, so as to reduce spilling and waste of material to a minimum.

It is a main object of my present invention to provide a design, arrangement and construction of bag holder which meets the foregoing and other necessary requirements in a high degree and thereby enables efficient and rapid filling of bags, while retaining for the holder the highly desirable characteristics of simplicity of structure, light weight with compactness, durability and minimum of upkeep in use, and ease and efficiency with simplicity of operation so as to permit of the holder being employed and operated by so-called unskilled operators to rapidly and properly fill the bags or sacks with the desired materials.

As bags or sacks of different lengths and mouth diameters are encountered in the operation and use of such bag holders, it is a further object and important feature of my present invention to provide for the adjustment of the bag holder to efficiently accommodate and hold bags of different lengths and to yieldingly suspend a bag to be filled in its vertically extended position while empty above a bag supporting surface, in such a manner that at the start of the filling operation the weight of material discharged into the bottom of the bag will overcome the yielding suspension thereof and lower the bag to and with the weight of material therein supported on the bag supporting surface, while a sufficient tension is applied to the upper, mouth end of the bag to maintain the bag extended throughout its length during the remainder of the filling operation.

Another object and feature of my invention is found in the design, arrangement and mounting of the bag mouth or bag upper end receiving and attaching member through the medium of which a bag can be rapidly and easily attached in position thereon for filling, by which the bag is maintained in extended vertically disposed, mouth open position during filling, and the arrangement of which is such that through cooperation with the yielding suspension and bag tension exerting mechanism, a filled bag can be readiy and quickly detached and removed in a simple manner with a minimum of effort; and further to provide such member which will permit of attachment of bags thereto of varying mouth diameters or sizes.

Another feature of the invention resides in the arrangement of the holder so that the bag mouth receiving and attaching member upon removal of a filled bag therefrom, automatically returns to proper position and adjustment for immediate attachment thereto of an empty bag for filling, thus materially reducing the time required to fill a plurality of bags.

It is usually necessary, particularly in the bagging of grain and such like materials, to weigh the bags after filling, and a feature and object of my invention, is found in the design of the holder and the supporting base thereof to permit of the holder being placed in operative position upon and supported by a scale platform, so that the bags are weighed as filled and can then be removed from the holder without the additional delay of a separate weighing thereof after removal.

As a further feature a holder of my invention is arranged for folding or partial collapse to a compacted position so as to occupy a space when not in use for storage or shipment.

Another feature of the invention resides in the provision of a shield for removable mounting on and in cooperative relation with the bag mouth holding member, so as to aid in directing material into, the open bag mouth and prevent spilling and waste of the material being discharged into a bag during the filling operation.

With the foregoing general objects, as well as certain other objects and results in view which will be readily apparent from the following explanation, the invention consists in certain novel features in construction and in combination and arrangement of elements, as will be more fully and particularly referred to and specified hereinafter.

Referring to the accompanying drawings, in which similar reference characters refer to corresponding parts throughout the several figures thereof:

Fig. 1 is a perspective view of a bag holder embodying features of the invention with an empty bag attached thereon and held in position thereby for filling, the mouth shield being shown in applied operative position.

Fig. 2 is a vertical longitudinal section through the vertical frame and base of the holder of Fig. 1 but showing the bag mouth attaching ring or rim with its vertically slidable supporting frame in side elevation, an empty bag being shown in operative position attached on the mouth ring in dotted outline.

Fig. 3 is a view in side elevation of the upper end portion of the vertical frame and of the bag mouth ring and its supporting frame, showing a bag in the first step of attachment of the open upper or mouth end thereof to the holding ring.

Fig. 4 is a view similar to Fig. 3 showing a further step in the attachment of the bag to the ring.

Fig. 5 is a perspective view of the upper end of the holder and of the bag mouth receiving ring and showing a bag in final attached position thereon for filling.

Fig. 6 is a fragmentary perspective view of one end of the removable shield and of the adjacent bag mouth receiving ring pivot and frame for removably receiving and mounting the shield member.

One possible embodiment and mechanical expression of a bag holder incorporating the various features of my invention is illustrated in the accompanying drawings purely by way of example and not by way of limitation, for the purpose of explaining and describing the said several features and principles of my invention by which the results obtained thereby may be secured.

In the illustrated embodiment, referring particularly to Figs. 1 and 2 of the drawings, the bag holder includes a vertical supporting framework comprising the spaced and substantially parallel vertical columns 1 secured together in spaced relation at their upper ends by the transverse plates 9 riveted or otherwise secured to opposite sides of the columns, and at their lower ends maintained in spaced fixed relation by the block or filler piece 19 fitted and secured between and attached to the columns by opposite edge tongues (not shown) received in the longitudinally disposed and alined grooves 15 formed in the spaced inner edges of the spaced columns. At the back or rear sides of the vertical columns 1, brace bars 2 disposed longitudinally thereof respectively, are secured to strengthen the columns and prevent warping or twisting thereof. The columns are thus rigidly fixed together by plates 9 at their upper ends and the connecting or filler piece 19 at their lower ends. This vertical supporting framework is pivotally mounted at its lower end to a supporting base or platform 3 by the hinges 7 with the vertical frame formed by the columns 1 extending downwardly across the adjacent side edge of platform 3, as will be clear by reference to Figs. 1 and 2. Opposite side diagonally disposed brace or tie rods 4 are pivotally connected at their upper ends to the outer edges respectively, of the columns 1, spaced above platform 3 and extend downwardly and forwardly to opposite side edges respectively of the platform where they are detachably secured by the wing nuts 6 carried by the pins or bolts 8, the lower ends of the rods 5 being forked and fitted over pins 8. By this arrangement the lower ends of the rods 4 may be detached from the platform 3 and swung upwardly to positions longitudinally along adjacent opposite edges respectively of the columns 1, after which the platform 3 can be swung upwardly on hinges 7 to position folded against the front side of the columns 1. In this way the supporting framework of the holder can be collapsed to a more compact form and especially to permit of the holder being readily moved and transported from place to place as may be desired.

Preferably the platform or supporting base 3 is so designed as to permit of its being received upon the platform of a suitable scale when the holder frame is in unfolded operative position so that bags attached to the holder and filled thereon will be weighed without the necessity of weighing after filling and removal from the holder.

A member or carriage 16 is mounted and confined between the spaced vertical columns 1 for vertical sliding movement, and in the example hereof this carriage 16 is provided with the opposite flanges 17 along its longitudinal edges which are slidably received in the opposed grooves 15 respectively in the inner edges of the spaced columns 1. The downward movement of carriage 16 is limited by the lower end piece 19 between the columns, the upper end of which forms a stop for the carriage 16 on downward movements thereof. A pulley 11 is supported in position between and at the upper ends of the columns 1 above the sliding carriage 16, and in the example hereof is supported by the fork 12 secured on a pin 10 disposed and extending transversely between plates 9. The fork 12 carries a pulley axle or shaft 13 on which the pulley 11 is rotatably mounted.

The upper end of the carriage 16 is attached to an end of the rope or cable 32, which rope extends upwardly therefrom over and around the pulley 11 and downwardly along the rear side of the vertical frame where it is attached to the upper end of a tension spring 34, which spring is secured at its lower end to a chain 36, which in turn is detachably secured over a pin 37 fixed adjacent the lower end of the piece 19 secured between vertical columns 1. The carriage 16 is thus normally held in raised or elevated position between columns 1 but is capable of downward sliding movement therebetween upon the application thereto of sufficient forces to overcome the tension of spring 34.

The member or carriage 16 is provided with a supporting frame for the bag holding and receiving ring or rim 20, which framework in the present example comprises a cross bar or member 27 secured transversely across the forward side of the carriage 16 adjacent its lower end, and the arms 26 extending forwardly and outwardly from opposite ends of the cross bar 27, being secured to bar 27 by the bolts 28. These arms 26 in the example hereof are inclined upwardly from bar 27 and are bent to form the eyes 25, being then continued rearwardly and upwardly and are curved inwardly toward each other to provide the arms 21, which arms 21 extend and are secured in converged relation to the upper end of the carriage 16 by the bolt or the like 22. If desired a suitable sleeve or the like 23 can be provided

enclosing and binding the converged ends of arms 21 together. Thus the foregoing arrangement of arms 21 and 26 provide spaced forwardly from the carriage 16 and the vertical columns 1, the spaced axially alined eyes 25 into and between which the bag mouth or receiving ring or rim 20 is pivotally received and supported in normally horizontally disposed position. While in the present instance the arms 21 and 26 are formed from a single length or rod of material, the invention is obviously not so limited as this supporting framework embodying these arms can as well be formed of several separate members suitably secured and attached together to provide a similar or equivalent arrangement.

The bag mouth receiving and attaching ring or rim 20 is provided with the diametrically opposite and axially alined pivot pins or stud shafts 24 which are rotatably received and journaled in the spaced eyes 25 formed from and carried by the arrangement of arms 21 and 26. The rim 20 is thus pivotally mounted and disposed in position between and carried by arms 21 and 26 and is vertically movable with the carriage 16 as will be readily apparent.

The ring or rim 20 is provided to receive and have attached thereto the open upper or mouth end of a bag 38, and in accordance with a further feature of the invention this rim 20 is formed and constructed to provide means enabling the ready attachment and detachment of a bag thereto and therefrom. In carrying out this feature of the invention in the present example a series of attaching tangs or prongs 39, 40, and 41 are cut and formed from the rim, bent outwardly and extended upwardly therefrom for piercing and attaching the bag to the rim. The prongs 39 are disposed extending toward each other but spaced apart at the inner or rear side of rim 20 adjacent the vertical supporting frame. The prongs 40 are formed in relatively closely spaced relation and extended toward each other at the right hand portion of the forward side of the rim facing, Fig. 5 of the drawings, while the single prong 41 is formed at the left hand side on the forward portion of the rim spaced from but pointed toward the prongs 40. At the rear side of the rim 20 a rearwardly and upwardly extended bag confining and retaining lip or projecting tab 43 is suitably secured to or if desired formed from the material of the rim.

In operative position the tension spring 34 maintains the carriage 16 in its elevated or raised position with the bag mouth ring or rim 20 supported between the spaced arms 21, 26 above the base or platform 3 of the frame and in position for attachment of the bag or sack thereon in position for filling. In accordance with the invention the attachment of the upper end of the bag 38 to the holding ring or rim 20 is carried out in the following manner, referring now particularly to Figs. 3, 4 and 5 of the drawings. The bag 38 is grasped at opposite sides by the hands of the operator with the upper or mouth end distended or opened and the edge of the bag is passed over the exterior of the rim 20, the rim being tilted downwardly, at the inner side thereof adjacent the supporting framework with the tab 43 retaining the bag in position thereon against upward displacement over the rim, as will be clear by Fig. 3 of the drawings. In this position the bag is hooked and attached over and pierced by the prongs 39 spaced from and at opposite sides of tab 43 (see Figs. 3 and 5). The rim 20 is provided at the right hand side (facing Fig. 5 of the drawings) with its under edge bent or flared outwardly to form the thumb catch or hand hold 42. After the bag is in the preliminary position of Fig. 3 with the rim 20 tilted downwardly, the operator holds one side of the bag with one hand and then with the thumb of the other hand applied to the catch 42 tilts or swings the rim 20 downwardly to substantially horizontal position as shown in Fig. 4, after which the hand is removed from the thumb catch 42 and the adjacent upper end of the bag is grasped and attached over the inner prong 40 which pierces the bag and secures the same at that side to the rim as clearly shown by Fig. 4. After this operation the opposite side of the bag is attached over and secured to the prong 41, the bag then being tightly stretched around the exterior of rim 20 with a fullness or surplus material remaining between prong 41 and the prongs 40 at the forward side of the rim. This fullness is taken up by folding the material and securing the folds on the forward prongs 40 to thereby complete the attachment of the bag in position secured tightly and firmly to and around the exterior of the rim, with the bag body depending therefrom and the bag suspended thereby in vertically disposed full extended position, as clearly disclosed by Figs. 1, 2 and 5 of the drawings in particular. This operation of attaching the bag in position to the rim can be readily quickly carried out and by the arrangement and design of the rim 20 and the series of prongs thereon, insures a proper secure attachment of the bag to the rim in the desired position against displacement during the filling operation.

Preferably, of course, the diameter of the bag mouth ring or rim 20 is substantially such as to accommodate and permit the attachment thereover of bags having mouths of the smallest diameter which it is desired to employ with the holder. In this way the holder is thus enabled to readily care for bags with larger sized mouths as desired by taking up the surplus material around the rim 20 through securing folds of the bag over the forward prong of the spaced prongs 40, as shown by Fig. 5 of the drawings. In this way the holder of my invention is enabled to take care of and have attached thereon bags of a wide range of mouth diameters.

It is highly desirable in accordance with a further feature of my invention that the carriage 16 with the bag holding and attaching rim 20 be adjusted and positioned at such a distance above the base or platform 3 that when a bag is attached in position depending and suspended therefrom, the lower end or bottom of the bag will be spaced a slight distance above such supporting base or platform 3. In order to carry out this feature provision is made through the chain 36 by which the cable 32 and its tension spring 34 are secured to the holder framework for adjusting and varying the height at which rim 20 is normally maintained above platform 3 by the tension spring 34. This positioning of rim 20 can be varied by shortening or lengthening the length of chain 36 between the lower end of spring 34 and the attaching pin 37. For example referring to Fig. 2 of the drawings, if it is desired to attach a bag of less length than the bag 38 to holder 20, the chain 36 is detached from pin 37 and the carriage 16 with rim 20 lowered the proper distance on columns 1, and the chain 36 is then reattached by a link thereof to maintain rim 20 at the desired readjusted height. In this manner bags of varying lengths may be accommodated

and utilized with the holder, the bag 38 shown by way of example in the drawings being substantially of the maximum length to be handled by the holder.

With the bag 38 in attached position suspended from the rim 20 with its lower ends spaced a slight distance above platform 3, as shown by Figs. 1 and 2 of the drawings, the bag is in position for filling with the rim or ring 20 maintaining the upper or mouth end of the bag in substantially full opened position. Upon discharge of the material with which the bag is to be filled into the open upper or mouth end of the bag, the weight of the material discharged into the bag will shortly after the start of the filling operation overcome the tension of spring 34 and cause the carriage 16 with rim 20 and the bag attached thereto, to drop or lower until the bottom of the bag and the weight of the material therein is supported and rests upon the base or platform 3. In this supported position, however, the action of the tension spring 34 will be continuously exerted upon cable 32 to maintain carriage 16 and the bag holding rim 20 in elevated or raised position pulling against the weight of the material in the bag, so that the bag is maintained in the necessary full vertically extended position for the proper and efficient filling thereof. The weight of the material discharged into the bag is thus supported by platform 3 while the bag body and side walls are continuously maintained in the vertically extended position against folding, wrinkling, or creasing while the material is being discharged into the bag. As hereinbefore pointed out by positioning the holder with the platform 3 and the vetrical supporting frame hinged thereto, upon a suitable scale platform, the weight of each filled bag is obtained before removing the filled bag from the holder, and thus the usual additional step of weighing the filled bags after removal is done away with.

When a bag is being filled by means of various filling machinery employing spouts, conveyers or elevators or the like for directing the material more or less straight down into the bag mouth from above, there is not the tendency of the material to be spilled on the outside of the bag, but where the material is being placed into the bag by hand, as by the use of shovels, scoops, or the like, or where the materials are being directed into the mouth of the bag at an inclination from the forward side thereof, my invention provides the shield 29 to prevent or reduce the spilling of the materials. Referring particularly to Fig. 6 in connection with the remaining figures of the drawings, this shield 29 is of curved shape to fit around and across the rear side of the mouth ring 20, and is provided at its opposite forward ends with the members 30 riveted or otherwise suitably secured thereto, or formed therefrom, which members depend a distance below the shield lower edge to terminate in the forked ends 31. The diametrically opposite outwardly extending pivot pins 24 on the mouth rim 20 which are journaled in the eyes 25 and support the mouth rim in position, are given a sufficient length to leave a space thereon between the rim 20 and the inner side of the eye 25 in which mounted, as is shown by Fig. 6 in the drawings. The shield 29 is removably mounted by engaging the depending fork members 31 over the opposite rim pivot pins 24 with the shield extending around and across the rear side of the rim 20 and received in and between the converging curved portions of the arms 21 of the rim supporting frame (see Fig. 1). The shield is thus removably supported in position around the rear or inner half of rim 20 in position supported thereon at its forward ends by the pins 24 and at its rear by rim 20 and the arms 21. The shield can be quickly removed and as readily mounted and installed in place when desired or found necessary.

After a bag has been filled to the desired extent, by the arrangement and construction of the bag mouth receiving ring or rim 20 and the bag attaching prongs formed thereon, the filled bag can be quickly and easily detached and removed therefrom. The detachment of the bag is carried out by first unhooking the bag from the prongs 40 and 41 at the forward side of rim 20, whereupon due to the action of the spring 34 tending to elevate and raise carriage 16 with rim 20, the rear side of the rim 20 will be pulled downwardly because of the weight of the filled bag, to thus swing or rotate rim 20 to say the approximate position of the rim as shown in Fig. 3. This action will automatically release and slip the bag from attached position on and over the rear prongs 39, due to the angle and position of these prongs. It is thus evident that the detachment of the bag is a very rapid operation and secured by the one act of the operator in detaching the forward side of the bag from the prongs 40 and 41. Immediately upon release of the filled bag the spring 34 will elevate carriage 16 and the mouth receiving rim 20 to position for attachment of an unfilled bag thereto. It is therefore possible to very rapidly attach, fill, and remove a filled bag, and attach an empty bag for filling to the holder, thus enabling a number of bags being filled at a minimum of time and effort and in a highly efficient manner.

The holder is of particular utility in bagging such materials as grain, vegetables and the like for shipment, although it is obvious that it may be employed for filling bags or sacks with any of an infinite variety of materials and the invention is not limited in any sense to any particular use to which it may be put.

It is evident that various changes, modifications, variations, substitutions, additions and eliminations might be resorted to without departing from the spirit and scope of my invention, and hence I do not wish to limit myself in all respects to the exact and specific disclosures hereof.

What I claim is:

1. A bag holder including a vertically disposed frame structure, a member vertically slidable on said frame, a bag mouth receiving and holding member mounted and supported on said slidable member and disposed in normally horizontally disposed position spaced outwardly from said frame structure and slidable member, and adjustable means normally yieldably maintaining said slidable member and bag mouth holding member carried thereby in elevated position, the said adjustable means including a pulley mounted at the upper end of said frame structure above said slidable member, a cable secured to the slidable member and extending over said pulley and downwardly therefrom along the frame structure, and a tension member adjustably secured between the frame structure and the lower end of said cable, said tension member normally yieldably raising and maintaining said slidable member in elevated position on said frame structure.

2. In a bag holder, a vertically disposed frame structure, a carriage vertically slidably mounted

on said frame structure, a pulley mounted on the frame structure above said carriage, a cable secured to the carriage and extending upwardly therefrom over said pulley and downwardly from the pulley along the frame structure, a tension spring connected to the lower end of said cable, a chain connected to the lower end of said spring and adjustably secured to the frame structure, said spring normally yieldably maintaining the carriage in elevated position on the frame structure, and a bag mouth receiving and attaching member supported from and movable with said carriage in position spaced laterally from the frame structure for holding a bag in vertically extended position suspended therefrom.

3. In a bag holder, a supporting frame, a carriage slidably mounted for vertical movements on said frame, horizontally spaced arms fixed to and movable with said carriage, said arms extending laterally outward from the carriage and provided at their spaced outer ends with axially alined horizontally disposed bearings, a bag mouth receiving and attaching ring member having axially alined pivot pins extended outwardly from opposite sides thereof, respectively, said ring member swingably mounted between said spaced arms with its pivot pins journaled in said arm bearings, means yieldingly maintaining said carriage and bag mouth ring member in normal elevated empty bag receiving position on said frame, and a bag mouth shield removably mounted on and extending around and upwardly from one side of said ring member, said shield embodying a curved plate having depending members at its spaced ends detachably fitted over and supported on said ring member pivot pins, respectively.

4. In a bag holder, a normally horizontally disposed, elevated bag mouth receiving and attaching ring member pivotally mounted for vertical swinging on a horizontal axis, said ring member provided at one side thereof with an upwardly extended member for positioning and confining the adjacent edge of a bag in position over the exterior of the member during the operation of attaching a bag, bag engaging prongs spaced at opposite sides of said bag positioning member and reversely inclined toward each other along the rim of said ring member for piercing and engaging the adjacent portions of a bag, and spaced prongs at the opposite side of the ring member for engaging the opposite side of a bag to firmly secure and attach the bag to and around the exterior of said ring member in position depending and suspended therefrom for filling.

5. In a bag holder, a supporting frame structure including spaced arms, a bag mouth receiving and attaching ring member pivotally mounted in horizontally disposed position between the adjacent free ends of said arms for vertical tilting to and from bag attaching position, and a bag mouth shield removably mounted on and extending around and upwardly from one side of said ring member, said shield comprising a curved plate provided with portions adjacent its opposite ends for removable engagement with the pivotal mounting for the ring member to maintain the shield in position against displacement.

6. In a bag holder, a bag mouth receiving and attaching ring member supported in normally horizontally disposed position, and means on said ring member for removably attaching the upper end of a bag to and around said member, said means including a pair of spaced prongs reversely inclined toward each other on the upper edge of the ring member at one side thereof for piercing a bag to attach the same around such side of the member, a similar pair of spaced prongs on the upper edge of the member at the opposite side thereof and reversely inclined toward each other to attach the opposite side of the bag to the member, and a prong adjacent and in proximity to one of said last mentioned prongs and reversely inclined with respect thereto for attachment of a folded over surplus portion of the upper end of a bag attached to the remaining prongs, in order to take up looseness and tightly secure a bag on and around the ring member.

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