Jan. 30, 1968 E. M. LAU 3,366,190

BAG FILLING MACHINES

Filed Nov. 22, 1966 6 Sheets-Sheet 1

FIG. 1

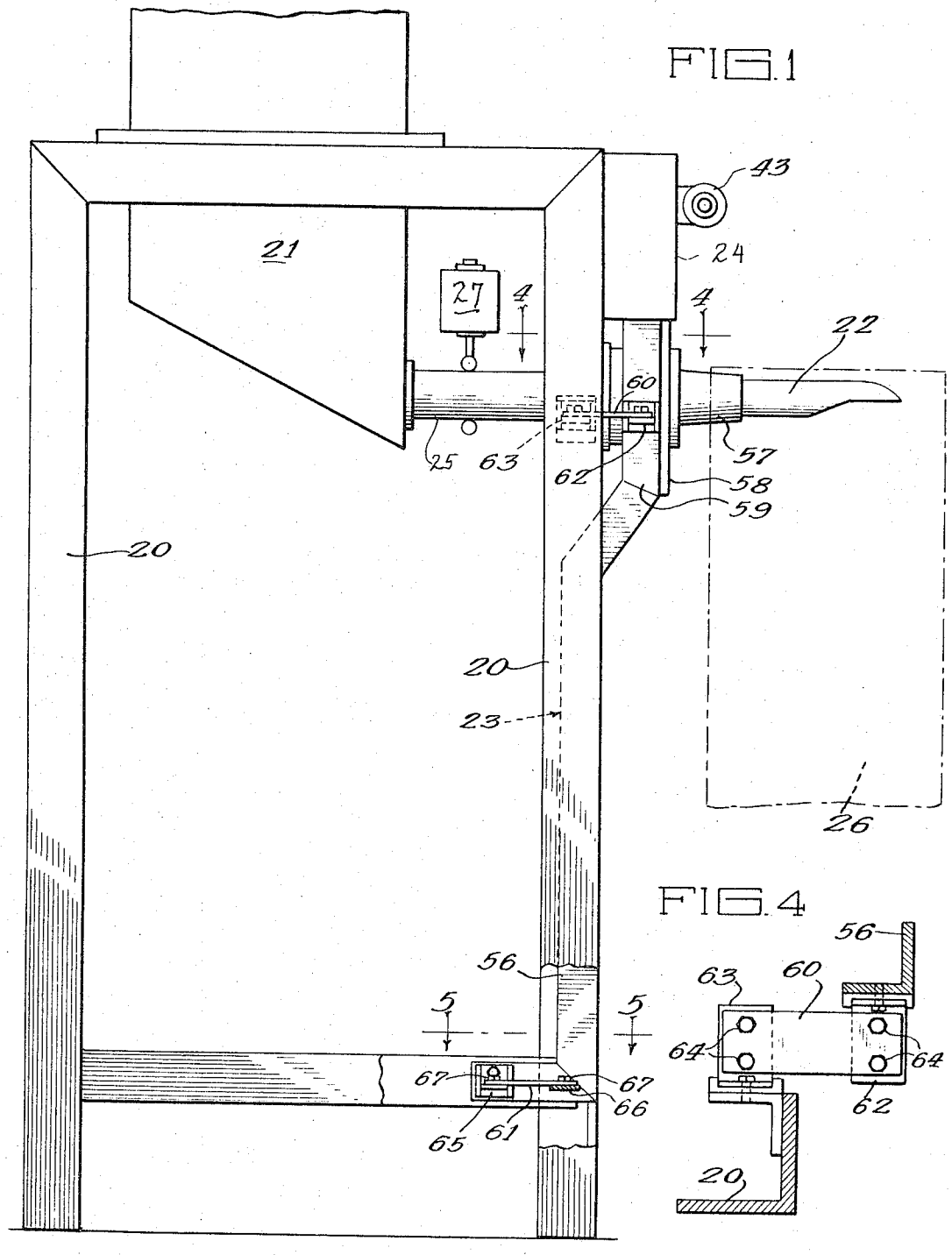


FIG. 4

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By: Zabel, Baker, York, Jones & Dittman
Attorneys

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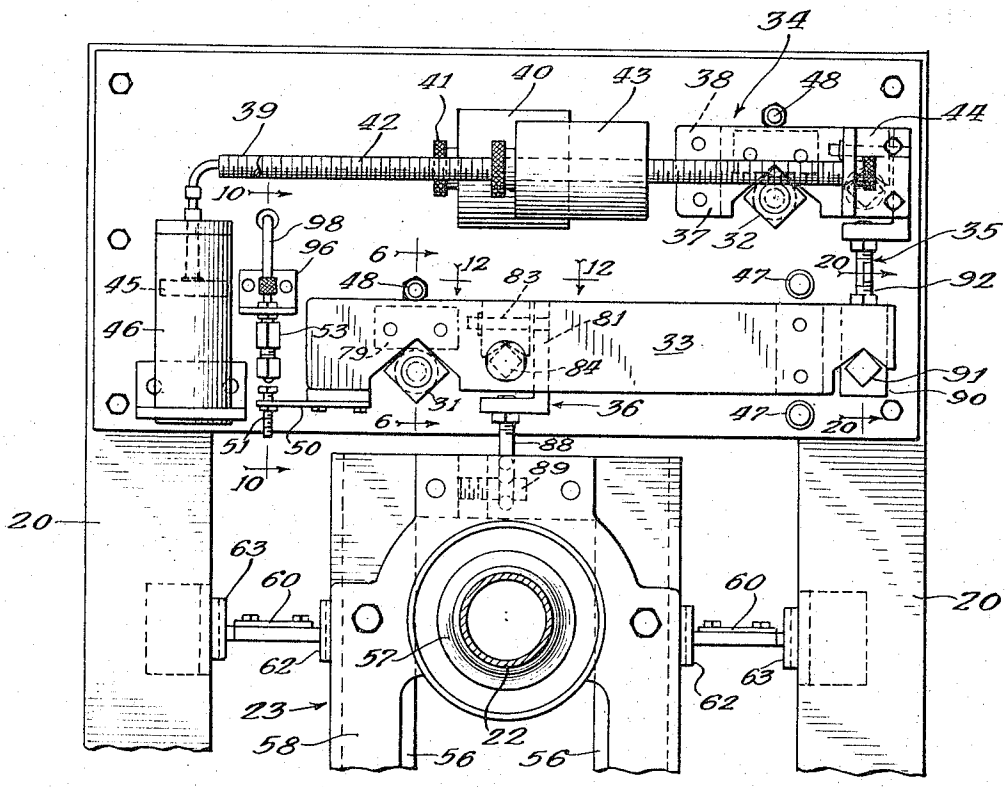


FIG. 2

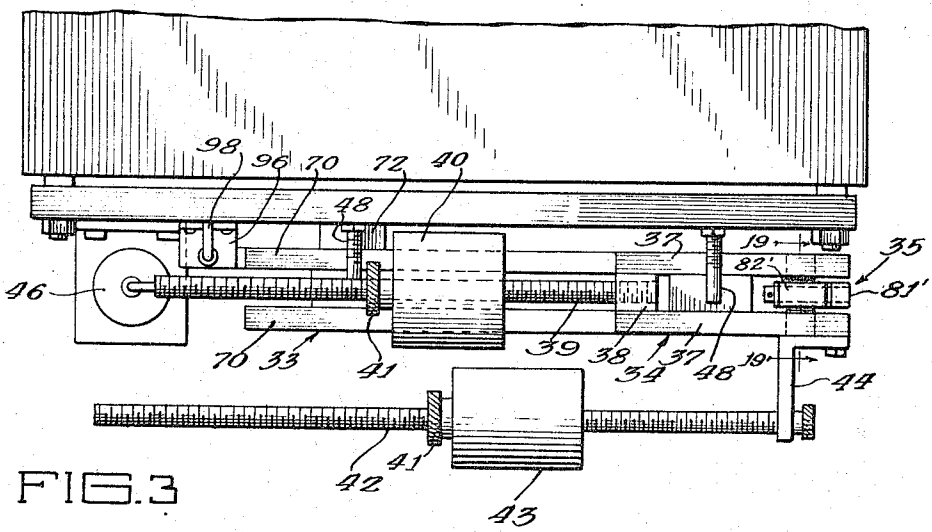


FIG. 3

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FIG. 6

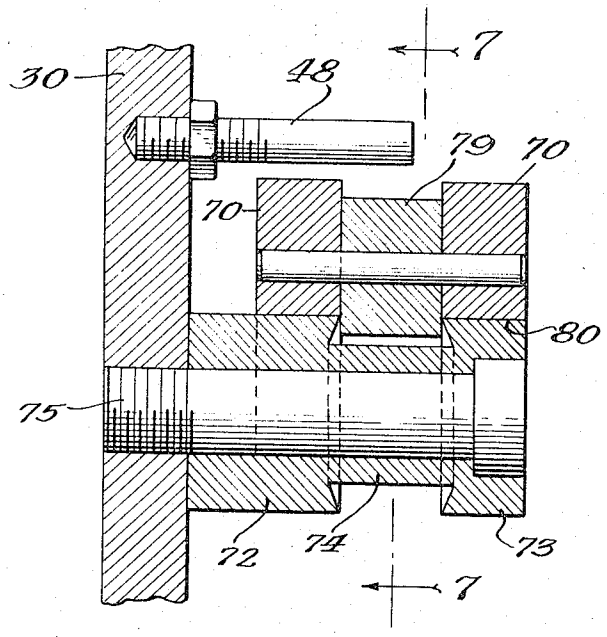


FIG. 8

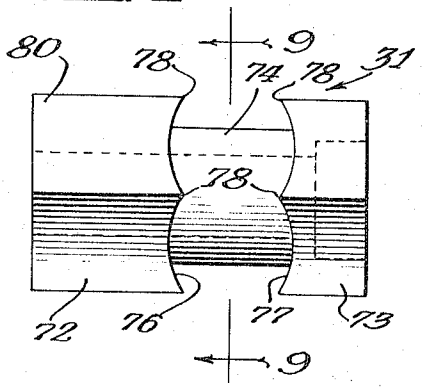


FIG. 9

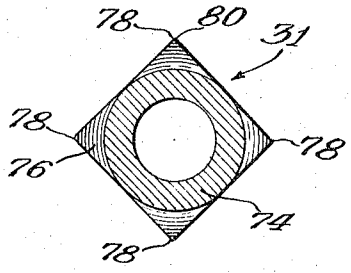


FIG. 7

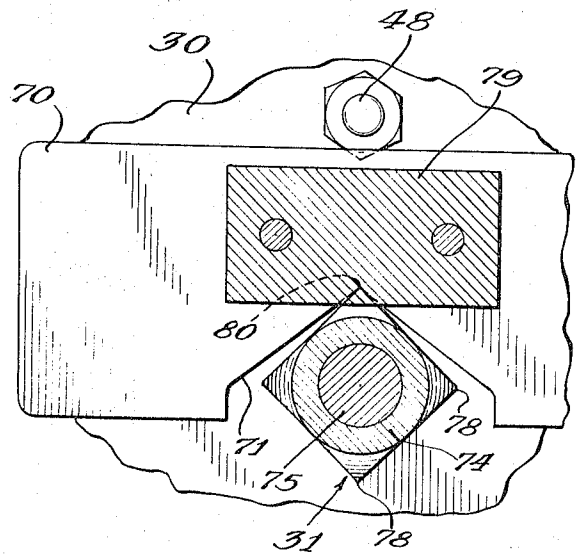
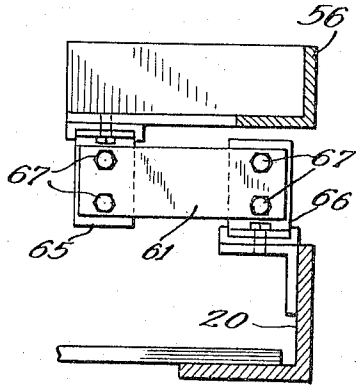


FIG. 5



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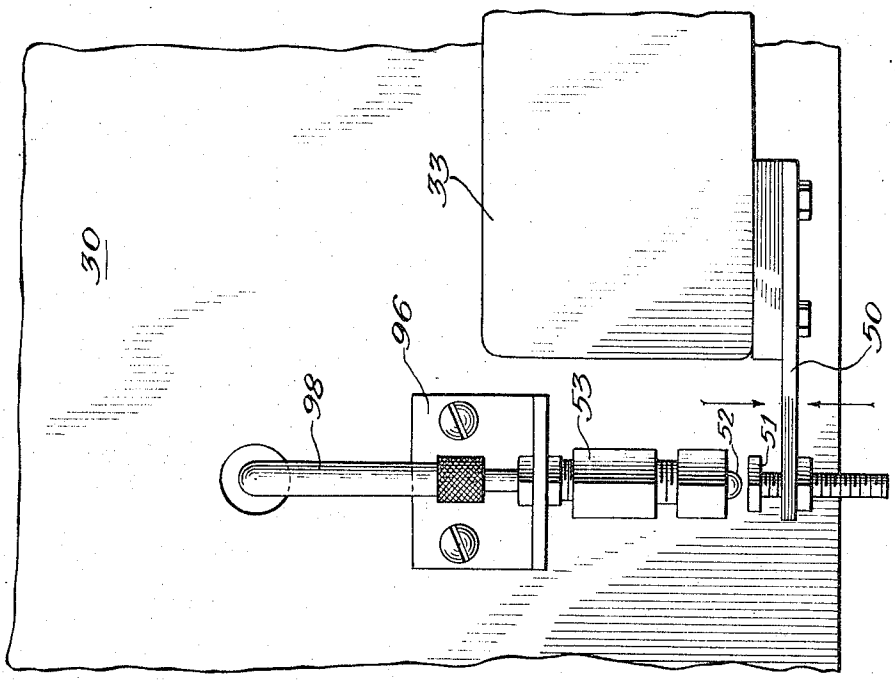


FIG. 11

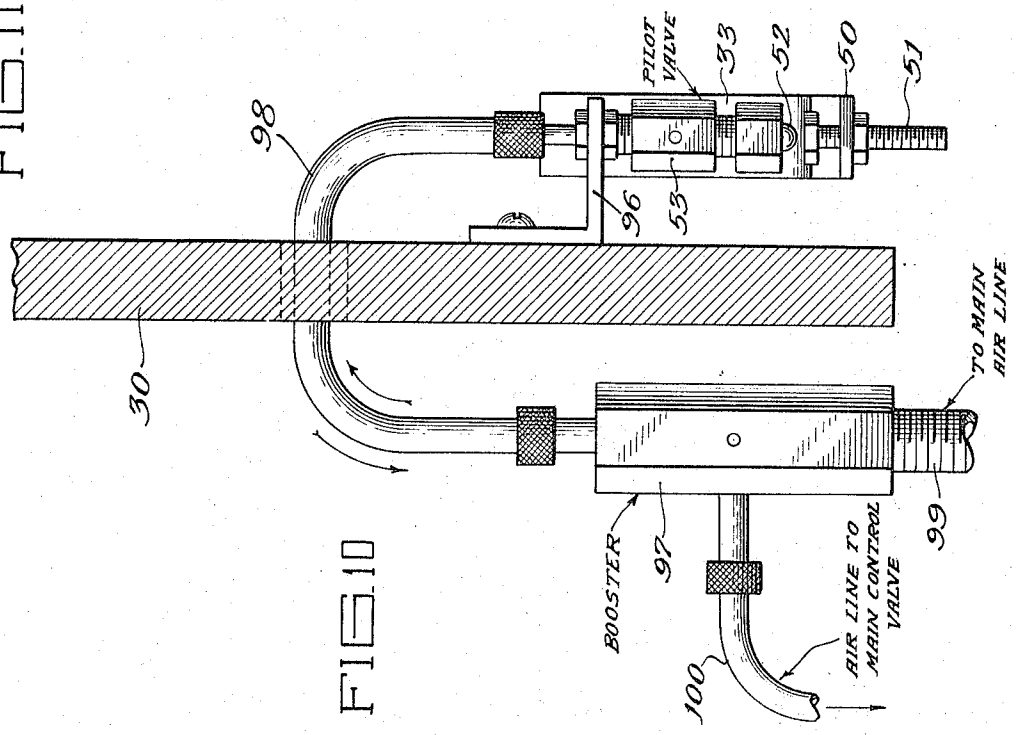


FIG. 10

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BAG FILLING MACHINES

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FIG. 12

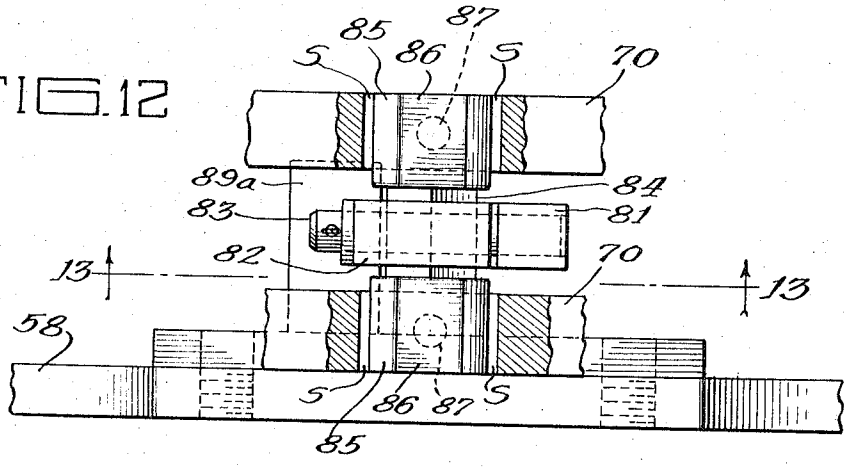


FIG. 13

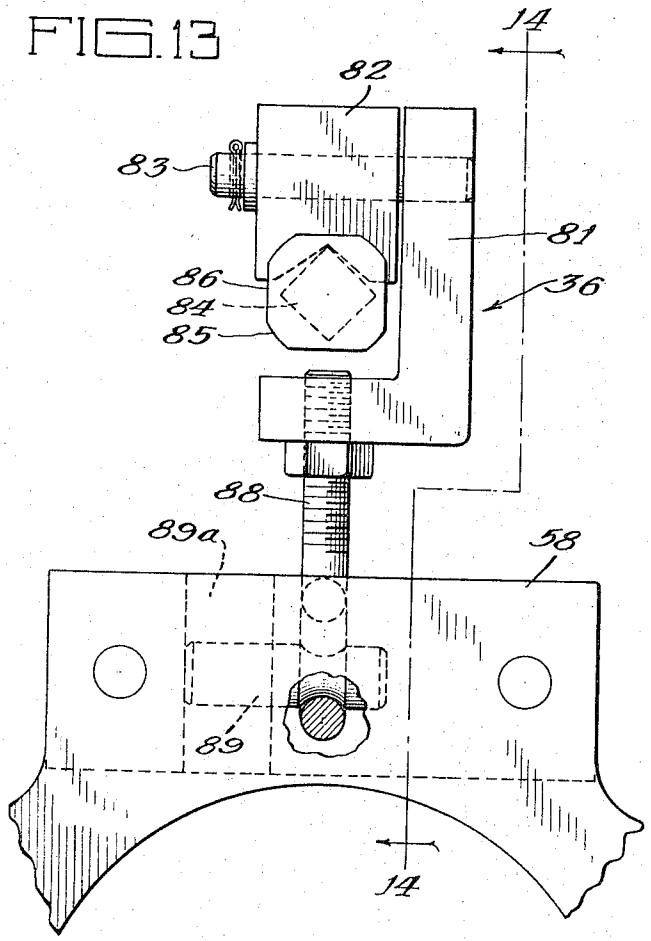


FIG. 14

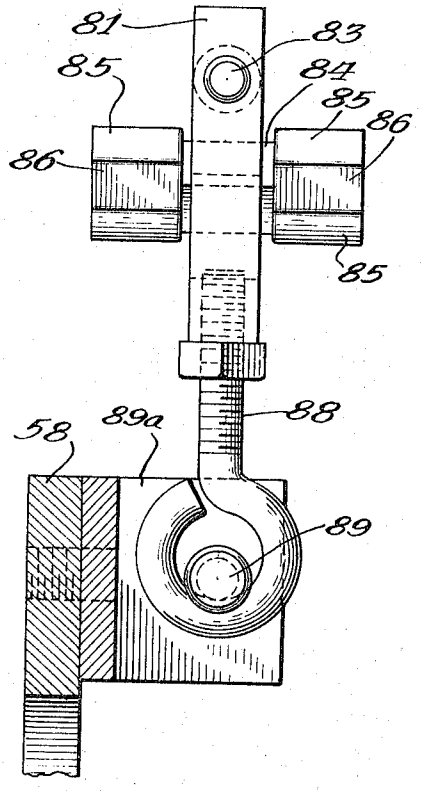


FIG. 15

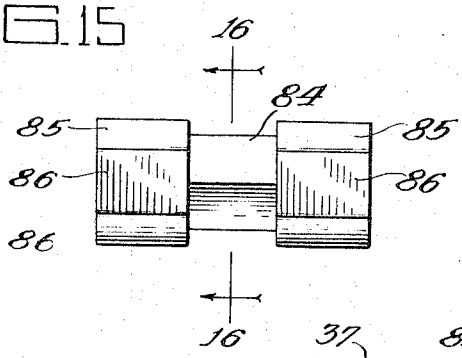


FIG. 16

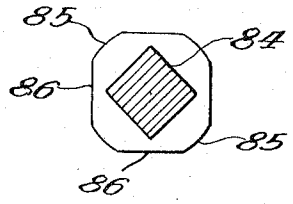
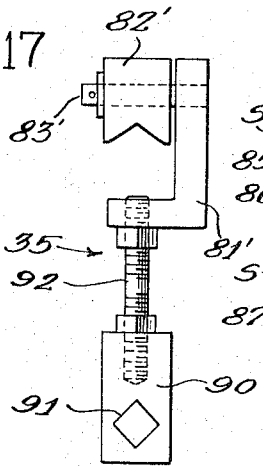


FIG. 17



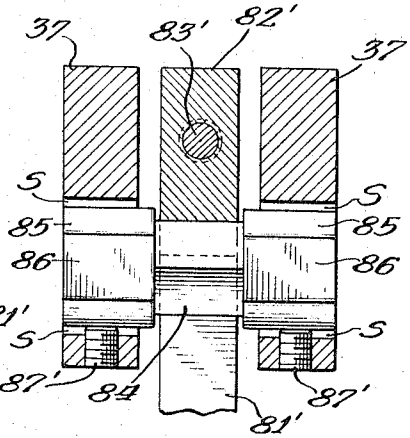


FIG. 19

FIG. 18

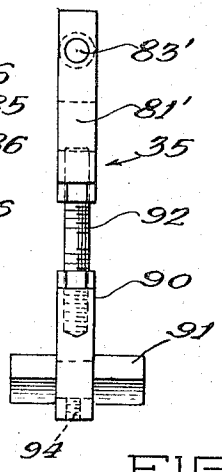


FIG. 20

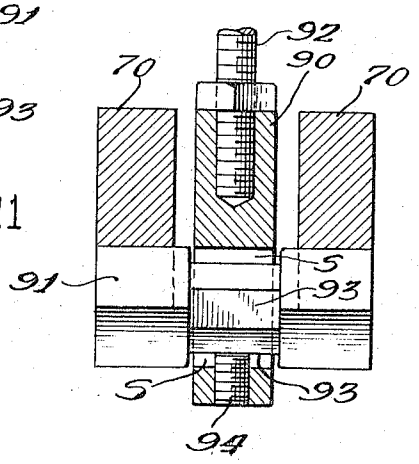


FIG. 21

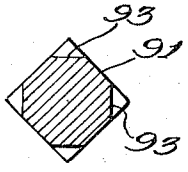
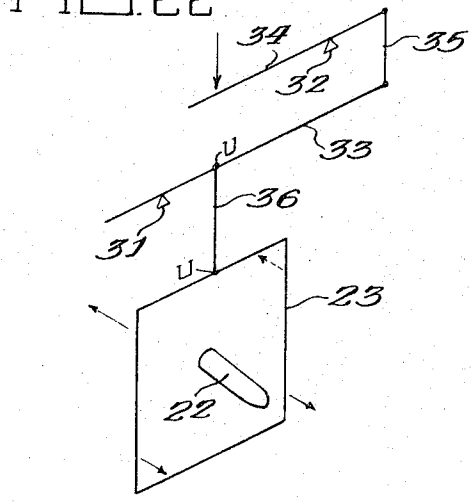


FIG. 22



United States Patent Office 3,366,190 Patented Jan. 30, 1968

3,366,190

BAG FILLING MACHINES

Erwin M. Lau, Dolton, Ill., assignor to Black Products Co., Chicago, Ill., a corporation of Illinois

Filed Nov. 22, 1966, Ser. No. 596,257
13 Claims. (Cl. 177—160)

ABSTRACT OF THE DISCLOSURE

The spout on which the bag is hung is mounted on a frame which is confined to vertical movement by leaf springs in tension. The scale mechanism is located above the spout with the beam extending from side to side. A special link connects the scale beam and the frame. The beam is a compound beam. Square bearing points may be indexed 90°, when worn, to provide a fresh knife edge.

This invention relates to bag filling machines of the automatic cut off type in which powdered or granular materials are fed into a bag suspended from the spout of a machine, and in which the feeding mechanism is automatically cut off when the weight of the bag contents reaches a predetermined amount. The invention is particularly concerned with the relationship of the spout mounting means to the scale mechanism, and the details of each.

An object of the invention is to provide a bag filling machine in which the scale mechanism is located above the spout, and at the front of the machine where it is readily accessible to the operator. In filling bags with powdered materials, it often happens that when the bag is removed from the spout, a small quantity of powder drops out of the spout. If the scale mechanism is located right at the spout, or beneath the same, the bearing points will become clogged; that is, dust will settle on the bearing points and will tend to become packed in the space between the point and the saddle or groove. This not only decreases sensitivity, but accelerates wear of the bearing.

Since the powder is airborne, this tendency exists even if the scale mechanism is not directly below the spout. However, when the scale mechanism is located above the spout, the tendency toward clogging is greatly reduced.

In one type of scale mechanism which has been commonly used in the art, the scale beam is oriented from front to back and pivots about a transverse axis. Since the spout communicates with the lower end of the chamber, it is not possible to locate the scale mechanism above the spout for the reason that the presence of the chamber will interfere with the forward and back extending scale beam.

In my Patent No. 3,133,608, granted May 19, 1964, I have provided a scale mechanism in which the beam is transverse and pivots about a forward and back axis which is parallel to the spout, and the fulcrum of the beam is located above the spout. However, in order to obtain stability, the beam is a U-shaped member which straddles the conditioning chamber, resulting in a rather heavy beam member which, because of its size, and because of the difficulty in aligning widely spaced fulcrums and bearings is rather costly to construct.

According to the present invention, I provide a front plate on the machine above the spout, and mount the scale mechanism on this front plate. Furthermore, in order to reduce the dimensions of the beam so that the machine can be held to relatively small width dimensions, I use a compound beam, one beam being located one above the other. Compactness is further achieved by making the lower beam in the form of a second class lever, whereas the upper beam is a lever of the first class. The balance weights are mounted on the upper beam, and in this connection I provide two balance weights, one providing a preset adjustment, and the other an operating adjustment.

Furthermore, my novel combination of what I term a tension stabilized spout supporting frame and a universal type coupling between the frame and the beam enables one to use a transverse beam type of scale mechanism without the use of a heavy beam member with widely spaced fulcrums to obtain stability, and enables one to arrange the beam parallel to the frame because misalignment of the frame with the beam does not affect the sensitivity of the scale mechanism. Also, the tension stabiilzed frame not only eliminates the effect of variations in the position of the bag upon the spout, but also permits auxiliary equipment, such as a bag saddle and a bag clamp, to be mounted on the frame without having the weight or location of the auxiliary equipment affect either the sensitivity or the accuracy of the weighing operation.

Another object of the invention is to provide an improved bearing point-saddle arrangement which prevents dislodgement of the beam from the fulcrum.

A still further object is to provide an improved fulcrum or bearing member which has a plurality of knife edges so that after one knife edge has worn, the member can easily be indexed to bring a fresh knife edge into use.

Other objects, features and advantages will become apparent as the description proceeds.

With reference now to the drawings in which like reference numerals designate like parts:

FIG. 1 is a side elevation of a bag filling machine embodying my invention;

FIG. 2 is a front elevation of the upper part of FIG. 1 with the beam housing removed;

FIG. 3 is a plan view of FIG. 2;

FIGS. 4 and 5 are horizontal sections taken along line **4—4** and **5—5**, respectively, in FIG. 1;

FIG. 6 is a vertical section taken along line **6—6** of FIG. 2, showing the fulcrum construction;

FIG. 7 is a vertical section taken along line **7—7** of FIG. 6;

FIG. 8 is an elevation of the fulcrum;

FIG. 9 is a section along line **9—9** of FIG. 8;

FIG. 10 is a vertical section along line **10—10** of FIG. 2 showing the arrangement of the control deveices;

FIG. 11 is a fragmentary front elevation of FIG. 10;

FIG. 12 is a fragmentary plan view along line **12—12** of FIG. 2, partially broken away;

FIG 13 is an elevation of the frame link and associated parts, substantially along line **13—13** of FIG. 12;

FIG. 14 is a vertical section along line **14—14** of FIG. 13;

FIG. 15 is an elevation of the bearing point of FIGS. 12 to 14;

FIG. 16 is a section along line **16—16** of FIG. 15;

FIG. 17 is an elevation of the beam link;

FIG. 18 is an ened view of FIG. 17;

FIG. 19 is a section along line **19—19** of FIG. 3, but with the bracket removed for purposes of clarity, and showing the upper end of the beam link and its relationship to the upper beam plates;

FIG. 20 is a vertical section along line **20—20** of FIG. 2 showing the lower end of the beam link and its relationship to the lower beam plates;

FIG. 21 is a medial section of the bearing point of FIG. 20; and

FIG. 22 is a diagram illustrating the operation of the device.

With reference now to FIG. 1, the bag filling machine comprises the machine framework **20** and a chamber **21** adapted to receive the powdered or granular material to be fed into the bags.

A bag supporting spout 22 communicates with the chamber 21 and is mounted at the upper end of a spout supporting frame 23. The spout supporting frame may also serve as a support for other equipment, not shown, such as a bag clamp and a bag saddle.

The spout supporting frame 23 is connected to scale mechanism (FIG. 2) which is enclosed in a beam housing 24.

Since the spout supporting frame 23 has relative vertical movement with respect to framework 20, a flexible connection is provided between the spout 22 and the chamber 21 in the form of a rubber tube 25.

Suitable feeding mechanism is provided for feeding the material from the conditioning chcamber 21 into the bag 26, which may be in the form of an auger, as in my Patent 2,733,040, or a pinch valve 27 which engages the rubber tube 25 to cut off the flow of fluidized material when the contents of the bag reach a predetermined weight, such as 100 pounds.

As shown in FIGS. 2 and 3, the scale mechanism includes a mounting plate 30 which is secured to the framework 20 by suitable screws. The mounting plate supports fulcrums 31 and 32 for a lower beam 33 and an upper beam 34. Beams 33 and 34 are connected at one end by a beam link 35. A frame link 36 connects the lower beam 33 and the bag supporting frame 23 and is located between the fulcrum 31 and the link 35.

The upper beam 34 is in the form of two spaced plates 37 which are spaced from each other by a block 38. A screw threaded rod 39 is secured in the block 38 and forms a part of the upper beam 34. A screw threaded balance weight 40 is mounted on the rod 39 and is secured in its adjusted position by a lock nut 41.

Also forming a part of the upper beam is a second screw threaded rod 42 which supports a second balance weight 43. The second rod 42 is secured to front beam plate 37 by means of a bracket 44. The bracket 44 extends through a slot in the beam housing 24 so that the balance weight 43 is accessible to the operator.

The outer end of the rod 42 is connected to the plunger 45 of a dash pot 46 so that transient movements of the beam 34 may be dampened.

Stops 47 limit the throw of the lower beam 33 (FIG. 2). A keeper 48, in the form of a removable stud (FIG 6) is located directly above each fulcrum 31, 32, to prevent disengagement of the beam from the fulcrum in a vertical direction.

At the left end of the lower beam 33, there is a projecting plate 50 which carries an adjustable contact lug 51 for engaging the plunger 52 of a control device 53 (FIG. 11).

The spout supporting frame 23 comprises two vertical angles 56 connected by suitable cross pieces, not shown. A spout mounting plate 58 is secured to the frame at its upper end, the spout 22 extending through the plate and being secured thereto by a suitable collar 57. The upper portion of the frame is offset forwardly at 59 (FIG. 1) so that it is disposed beneath the lower beam 33. The spout supporting frame 23 is connected to the framework 20 by leaf springs 60 and 61, as shown in FIGS. 1, 4 and 5, thus permitting movement of the frame in a vertical direction to a limited extent. As shown in FIG. 4, machined pads 62 and 63 are secured respectively to the angles 56 and 20, and the leaf springs 60 are secured to the pads by two screws 64 and suitable washers.

As shown in FIGS. 1 and 5, the machined pad 65 is secured to a rearward extension of the frame angles 56, and machined pads 66 are secured to the framework angles 20. The lower leaf springs 61 are secured to the pads 65 and 66 by two screws 67 and suitable washers. The arangement is such that all the leaf springs are under tension, and provide a reactive couple which countercts the effect of the location of the center of gravity of the bag 26, which is forward of the frame 23. The pads 62, 63, 65, 66 are mounted for vertical adjustment by screws.

The springs 60, 61 provide a frictionless support for the frame 23 as described in detail in my copending application 398,564, filed Sept. 24, 1964 and the diamensions and material of the springs are preferably as pointed out in that application.

The lower beam 33 is also a double beam, comprising two plates 70 (FIGS. 6 and 7) in which notches 71 are formed providing saddles for the lower fulcrum 31. The lower fulcrum 31 is an integral element fabricated from tool steel having two square end parts 72, 73 separated by a reduced neck or collar 74 of circular cross section. The end parts 72 and 73 are machined so as to provide four 90° knife edges of which any one is suitable as the bearing point of the fulcrum. The advantage of this arrangement is that as any one knife edge becomes worn, the unit can be indexed through 90° to provide a fresh fulcrum point 31.

The oppositely facing surfaces 76 and 77 of the square pieces 72 and 73 respectively, are undercut spherical surfaces to provide projecting corner points 78, shown in FIG. 8. The beam plates 70 are separated by a spacer block 79, doweled in place, which is located above the collar 74 and extends downwardly between the corner points 78. This interlocking of the spacer block 79 and the corner points 78 prevents axial displacement of the beam 33. Due to the fact that the point of contact between the corner points 78 and the side surface of the spacer block 79 is exactly at the axis of rotation, that is, the upper knife edge 80, there are no sliding surfaces which introduce friction. Thus, a very sensitive bearing point is provided for the fulcrum.

The upper fulcrum 32 is of substantially identical construction. There is a clearance of about .002 inch between each projecting corner point 78 and the spacer block 79 to prevent binding due to thermal expansion of the parts.

The frame link 36 connecting the frame 23 and the lower beam 33 comprises several parts, including an L-shaped member 81 shown in FIG. 13, and a saddle block 82 connected thereto by a pin 83. The saddle block 82 can rotate or adjust itself with respect to the pin 83 for alignment purposes, but nevertheless it is not a loose fit. Suitable means, such as a cotter pin prevents the saddle block from slipping off of the pin.

The notch in the saddle 82, as well as the notches 71, are substantially 104° for cooperation with the 90° bearing points 84 or 31, respectively. The saddle 82 engages a square bearing point 84 which is mounted in the beam plates 70, as shown in FIG. 12. This bearing point 84, as shown in FIGS. 15 and 16, has enlarged end portions 85 which are generally cylindrical, but nevertheless provided with flats 86. Thus the end portions 85 may be received in cylindrical bores formed in the plates 70 of the lower beam, and the flats 86 give an indication as to when the square section 84 is symmetrically disposed, and also provide a more effective point of engagement with the set screws 87. The arrangement provides a space S into which the set screws 87 extend (FIG. 19).

Secured to the lower part of the L-shaped member 81 is an eye-bolt 88, the eye of which is engaged by a grooved pin 89 which extends in a side to side direction and forms a part of the frame 23. Thus, the connection between the eye-bolt 88 and the pin 89 is a pivoted connection although no rotation takes place during operation. The pin 89 extends laterally from and is anchored in a block 89*a*, secured to the spout mounting plate 58.

The connection between the eye-bolt 88 and the grooved pin 89 is a pivoted connection which permits rotation about not only a side to side axis provided by the pin 89, but also about a front to back axis due to the substantially point contact between the inner toroidal surface of the eye and the substantially cylindrical surface of the pin 89. Thus, it provides a universal pivoted connection. Although the principal rotation between the upper end of the link 36 and the lower beam 33 is about

a front to back axis, nevertheless the pin **83** and the saddle block **82** provide a pivoted connection with respect to a side to side axis. Thus, the frame link **36** is a universal link because a universal pivoted connection is provided at both the upper and lower ends. This universal link accommodates any misalignment between the frame **23** and the lower beam **33**, which misalignment could be in the form of an offset along the front and back axis, or an offset along the side to side axis, or a canting of the spout supporting frame **23** with respect to the plane in which the lower beam **33** rotates.

The beam link **35** comprises an L-shaped member **81'** shown in FIG. 17, having a saddle **82'** connected thereto by a pin **83'**, these parts being substantially identical to parts **81**, **82** and **83**, and operating in the same manner. A square bearing point **84'**, substantially identical to bearing point **84** of FIGS. 15 and 16, is mounted in the plates **37** of the upper beam **35**.

Beneath the L-shaped member **81'** is disposed a block **90** carrying a square bearing point **91** shown in FIGS. 17, 18, and 20. A stud **92** connects the block **90** and L-shaped member **81'** and is locked in adjusted position by suitable jam nuts. Preferably the stud **92** has right hand threads at one end and left hand threads at the other to provide a turnbuckle action, by means of which the upper and lower beams may be adjusted to exact parallelism.

The square bearing point **91** is received in a square hole broached in the block **90**, and as shown in FIG. 21, the central portion of the bearing point **91** is slabbed to provide undercut flat surfaces **93** which can be engaged by a set screw **94** in the block **90**. The arrangement provides a space S into which the set screw **94** extends (FIG. 20).

Although the bearing point **91** is made of hardened tool steel, it nevertheless happens that there will be some deformation when the set screw **94** is screwed up tight. If the edge were not undercut, this deformation would prevent withdrawal of the bearing point from the block. However, by undercutting the edge at **93**, any deformation of the surface **93** will not interfere with the material of the block **90** so as to prevent withdrawal of the element **91**, incident to replacement or indexing for a fresh edge. The same feature is present in the enlarged ends **85** of the bearing point **84**, permitting the space S between the flats **86** and the wall of the bore in plates **70** or **37** to accommodate any deformation of the flat surface **86** by the set screw **87** so as to permit withdrawal.

FIGS. 10 and 11 show the details of the control device **53** which is secured to the mounting plate **30** by means of a bracket **96**. The control device **53** is connected to a second control device **97** located back of the mounting plate **30** by means of a U-shaped air conduit **98**. The two control devices **53** and **97** preferably are pneumatic control devices referred to as a pilot valve and a booster valve respectively for controlling the operation of an air actuated valve, not shown, for actuating the pinch valve **27**. The pilot valve and the booster valve are standard items of commerce, a suitable example of each being Model HTB–40, and HT–100 manufactured by Mead Specialties Company Inc., 4114 N. Knox Ave., Chicago, Ill. The control devices **53** and **97** are connected to an air line **99**, and a conduit **100** connects the booster control device **97** to the air actuated valve, not shown, for controlling the operation of the pinch valve **27**.

Thus, when the contents of the bag is of sufficient weight to cause tripping of the scale mechanism of the beams **33–34**, movement of the beam **33** will cause engagement of the plunger **52** by the adjustable contact lug **51**, and the resulting operation of the control devices **53** and **97** will cause the pinch valve **27** to close, thus shutting off further movement of the material through the spout **22**.

The operation of the machine is illustrated in FIG. 22 which shows in diagrammatic form the scale beams **33** and **34**, the spout supporting frame **23**, and the links **35** and **36**. The link **36** is a universal link because the pivotal connections at either end are universal connections, designated by the letter U.

In FIG. 22, the arrows on the spout supporting frame **23** indicate a reactive couple, provided by the tension members **60**, **61**, which counteracts the effect of the forward offsetting of the center of gravity of the bag from the axis of the eyebolt **88**. Thus the frame **23** could be characterized as a tension stabilized frame. The horizontal position of the frame **23** is determined by the tension members **60**, **61**, with the result that slight misalignments will exist between the frame **23** and the beam **33**. The universal link **36** accommodates these misalignments.

Either rigid links or a non-metallic flexible member such as a piece of rather stiff lathe belting, will provide a satisfactory low friction mounting for the frame **23** and which will at the same time serve as a suitable tension member, but the flexible metal leaf springs are preferred for the reason that the placing of the bag on the spout may involve horizontal forces and the leaf springs provide greater stiffness in all horizontal directions and at the same time provide a substantially frictionless movement in the vertical direction.

The forces exerted by the links **35**, **36** on the beams **33**, **34** are symmetrically disposed due to the double beam plate construction and the fact that the links **35**, **36** are disposed between the plates. The fact that the center of gravity of the bag is offset forwardly of the beam **33** does not tend to overturn the beam **33** forwardly on its fulcrum **31** due to the reactive couplee provided by the tension members **60**, **61**. Thus, the force transmitted to the beam **33** by the link **36** is a vertical force, subject only to slight inclinations of the eye-bolt **88** due to misalignment of the frame **23** which inclinations do not affect the uniform distribution of the load between the beam plates **70**.

This double beam plate construction and the swiveled saddle **82** on the links reduces any tendency of the bearing points to bind and provides a very sensitive scale mechanism.

Since stability is achieved without the use of widely spaced beam plates and separate fulcrums, a single fulcrum member **31**, **32** can be used for each beam, thus reducing alignment problems. Also, the compactness of the beam construction permits the use of a front mounted transverse beam.

The tension stabilized frame **23**, including the large vertical spacing between the upper and lower tension members **60** and **61**, renders it possible to mount rather heavy auxiliary equipment on the lower end of the frame, such as the settlers of my copending application Ser. No. 510,279 filed Nov. 29, 1965, or of my Patent No. 3,115,905 granted Dec. 31, 1963.

The balance weight **40** is used for counterbalancing the weight of the frame **23** and whatever auxiliary equipment is mounted on the frame, and hence is a pre-set adjustment which may be enclosed in the beam housing **24**. The balance weight **43** is used for setting the scale mechanism to trip for the different bag weights, such as 50 pounds or 100 pounds. Since this is an operating adjustment, the balance weight **43** is located outside of the beam housing **24**, as shown in FIG. 1, where it is readily accessible to the operator.

Since the fulcrum and bearing points are all located above the spout and enclosed within the beam housing **24**, the amount of dust or powder settling thereon is reduced to a minimum, thus providing longer bearing life and greater sensitivity.

The scale mechanism as a whole may be replaced by removing the mounting plate **30**; also the frame **23** may be readily replaced. Such replacement of these compo-

nents does not require accurate alignment, due to the universal link 36. In particular the universal pivoted connection at the upper end of the link provides the sensitivity of a bearing point-saddle construction which is not characteristic of universal connections in general, such as the eye and pin connection 88, 89.

Although only a preferred embodiment of my invention has been shown and described herein, it will be apparent that various modifications and changes may be made in the construction shown without departing from the spirit of my invention as pointed out in the appended claims.

I claim:

1. In a bag filling machine having a framework, a forwardly extending bag supporting spout and control means responsive to the increase in the weight of contents of the bag supported from said spout, scale mechanism comprising a frame supporting said spout, scale beam means mounted above said spout and having its fulcrum axis arranged substantially parallel to said spout, link means extending downwardly from said scale beam means and connecting same to said frame, and means confining said frame to vertical movement, said confining means comprising upper tension members extending rearwardly from said frame and connected to said framework and lower tension members extending forwardly from said frame and connected to said framework.

2. A bag filling machine as claimed in claim 1 in which said upper and lower tension members comprise flexible leaf springs.

3. In a bag filling machine having a bag supporting spout and control means responsive to the increase in the weight of contents of the bag supported from said spout, scale mechanism comprising a frame supporting said spout, scale beam means mounted above said spout and having its fulcrum axis arranged substantially parallel to said spout, link means extending downwardly from said scale beam means and connecting same to said frame, and means confining said frame to vertical movement, said link means including a universal pivoted connection between the upper end of said link and said scale beam means.

4. A bag filling machine as claimed in claim 3 in which said universal pivoted connection comprising a bearing point providing a knife edge mounted on said beam means, the axis of said bearing point being substantially parallel to said fulcrum axis, a saddle cooperating with said knife edge, and means for mounting said saddle on said link for rotational movement about a horizontal axis substantially perpendicular to said bearing point axis.

5. A bag filling machine as claimed in claim 3 in which said frame confining means comprises upper and lower flexible tension members.

6. In a bag filling machine having a bag supporting spout and control means responsive to the increase in the weight of contents of the bag supported from said spout, scale mechanism comprising a frame supporting said spout, scale beam means mounted above said spout and having its fulcrum axis arranged substantially parallel to said spout, said scale beam means being a compound beam comprising a lower beam and an upper beam, a mounting plate having vertically spaced upper and lower fulcrum members projecting therefrom, said lower beam being mounted on the lower fulcrum member and said upper beam being mounted on the upper fulcrum member, said beams being vertically aligned with an end portion of one located above the other, first link means connecting said end portions, second link means connecting said lower beam, at a point between said lower fulcrum and said first link means, with said spout supporting frame, and balance weight means adjustably mounted on said upper beam member.

7. A bag filling machine as claimed in claim 6 in which said balance weight means includes two balance weight members, a beam housing enclosing said scale beam means, one of said balance weight members being located outside of said housing, and the other of said balance weight members being located within said housing.

8. A bag filling machine as claimed in claim 6 in which said upper beam member includes a screw threaded rod, said balance weight means having a threaded bore cooperating with said screw threaded rod and being mounted on same.

9. A bag filling machine as claimed in claim 6 in which said upper beam and said lower beam each comprise two horizontally spaced parallel plates, a bearing point located between the two plates; of said upper beam and having end portions received in said plates, said first link means comprising an upright L-shaped member, a saddle for cooperation with said bearing point, means mounting said saddle on the upright portion of said L-shaped member for rotation about a horizontal axis which is perpendicular to the axis of the knife edge provided by said bearing point whereby said saddle can accommodate itself to slight deviations in the vertical alignment of said upper and lower beams, a block connected to the lower portion of said L-shaped member beneath said bearing point, a second bearing point mounted in said block and extending from opposite surfaces thereof and providing a knife edge which is substantially parallel to the knife edge provided by said first bearing point, the two plates of said lower beam having notches formed therein providing saddles for cooperation with the knife edge provided by said second bearing point, and means for adusting the effective length of said link in order to maintain said upper and lower beam in parallelism.

10. A bag filling machine as claimed in claim 6 in which said lower beam comprises two horizontally spaced parallel plates, a bearing point located between said two plates of said lower beam and having end portions received in said plates, said second link means comprising an upright L-shaped member, a saddle for cooperation with said bearing point, means mounting said saddle on the upright portion of said L-shaped member for rotation about a horizontal axis which is perpendicular to the axis of the knife edge provided by said bearing point whereby said saddle can accommodate itself to deviations in the vertical orientation of said second link.

11. A bag filling machine as claimed in claim 9 in which said bearing points are of square cross section providing four 90° knife edges, and means permitting said bearing points to be indexed through 90° to provide a fresh knife edge when the previously used knife edge becomes worn.

12. A bag filling machine having a bag supporting spout and control means responsive to the increase in the weight of contents of the bag supported from said spout, scale mechanism comprising a frame supporting said spout, a scale beam mounted above said spout and having its fulcrum axis arranged substantially parallel to said spout, link means extending downwardly from said scale beam and connecting same to said frame, a mounting plate having a fulcrum member projecting therefrom, said beam comprising two horizontally spaced parallel plates having aligned downwardly facing notches formed therein providing a saddle, said fulcrum member providing a knife edge engaging said aligned notches, the central portion of said fulcrum member being recessed, a spacer block located between said beam plates and extending downwardly into said recessed central portion to prevent dislodgement of said beam from said fulcrum member in a horizontal direction, said recessed central portion having undercut side walls providing projecting corner points coincident with said knife edge whereby the contact between a side surface of said spacer block and said fulcrum member will be a substantially point contact.

13. A bag filling machine as claimed in claim 12 in which said fulcrum member is of square cross section providing four 90° knife edges, a screw extending through said fulcrum members and threaded into said mounting plate, said recessed central portion being of circular cross section providing four pairs of undercut side walls and four pairs of projecting corner points, said screw permitting said fulcrum member to be indexed through 90° to provide a fresh knife edge when the previously used knife edge becomes worn.

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