L. V. RATHBUN.

FLEXIBLE FEED SPOUT.

APPLICATION FILED AUG. 17, 1908.

Patented Dec. 21, 1909.

943,891.

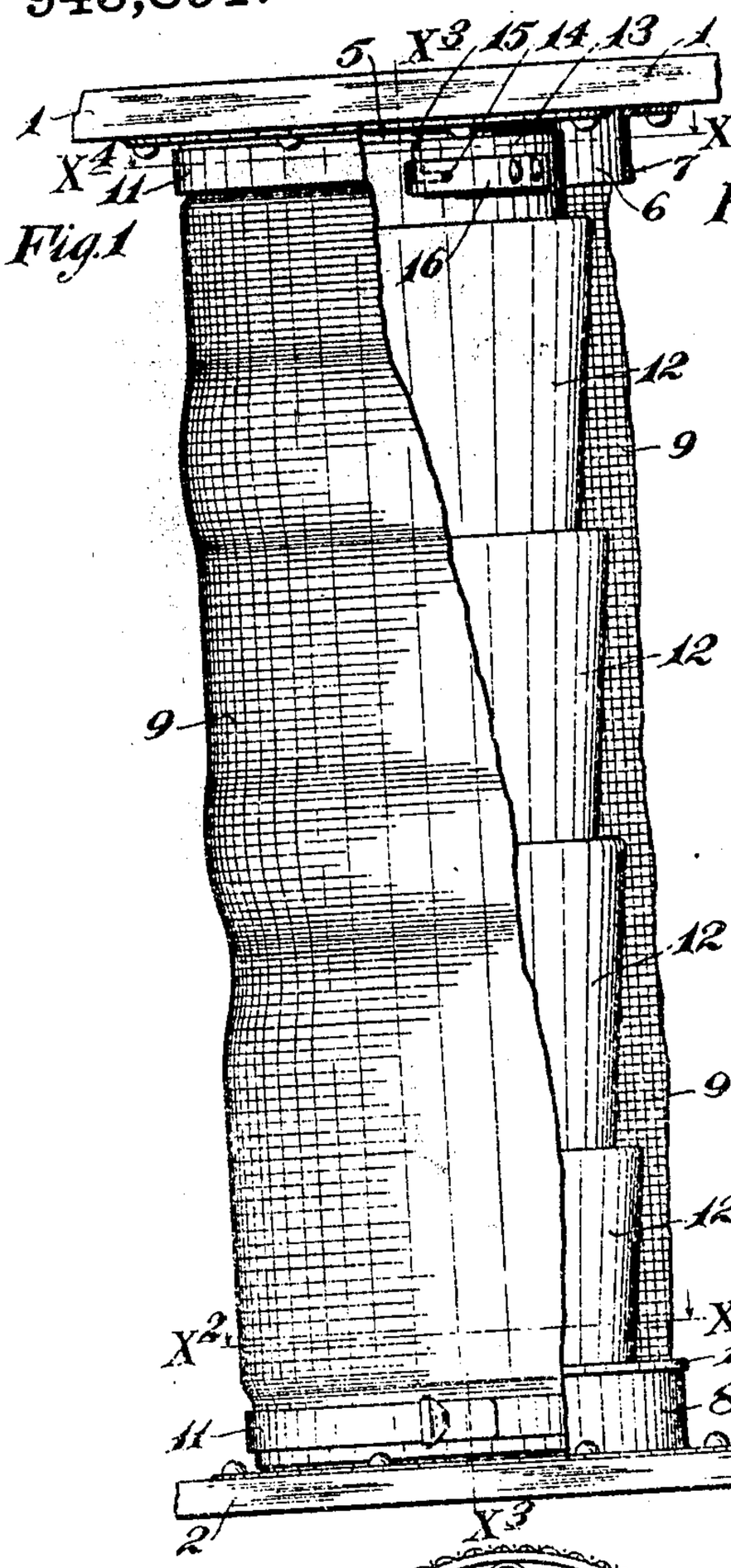

Fig. 1

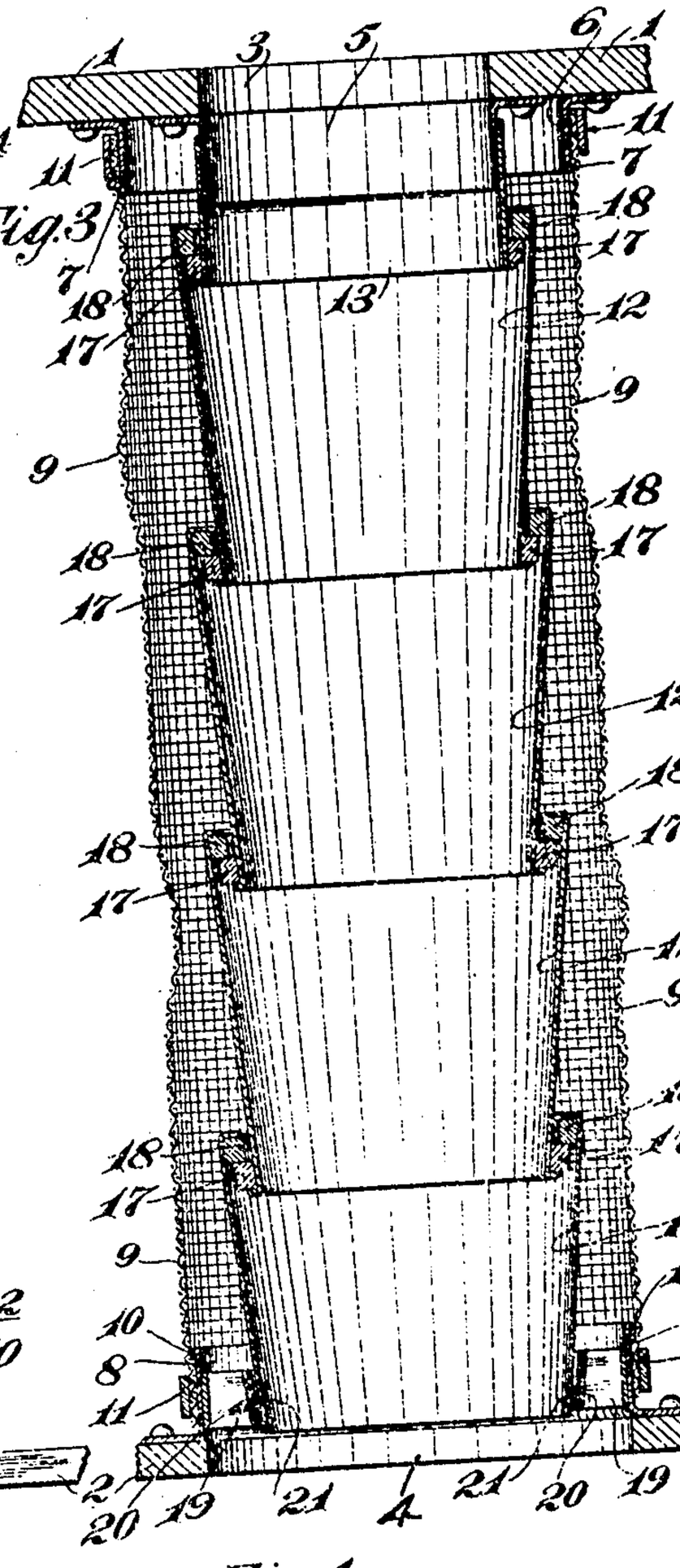

Fig. 3

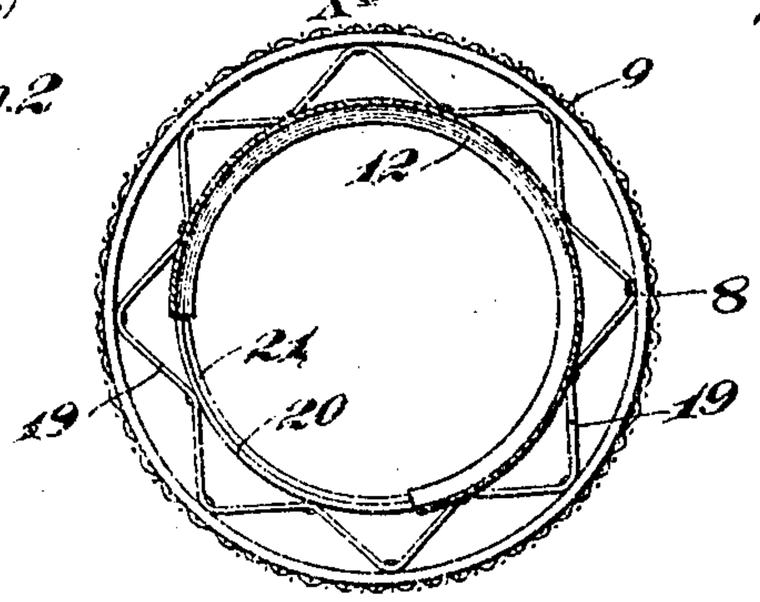

Fig. 2

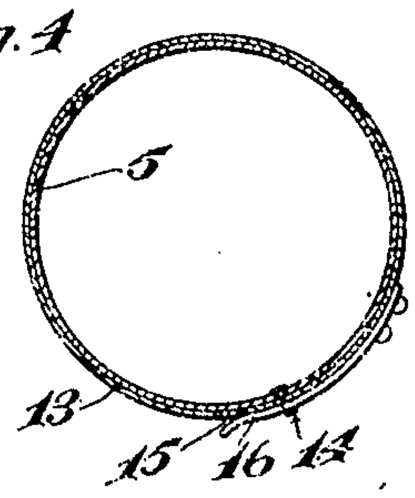

Fig. 4

Witnesses:

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UNITED STATES PATENT OFFICE.

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FLEXIBLE FEED-SPOUT.

943,891. Specification of Letters Patent. Patented Dec. 21, 1909.

Application filed August 17, 1908. Serial No. 448,793.

To all whom it may concern:

Be it known that I, LEWIS V. RATHBUN, a citizen of the United States, residing at Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Flexible Feed-Spouts; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its object to provide an improved flexible spout especially adapted for use in connection with gyratory sifters, but also adapted for more general use.

To the above ends, the invention consists of the novel devices and combinations of devices hereinafter described and defined in the claims.

In flour mills, for delivering the cereal to and from gyratory sifters, it has long been customary to employ flexible spouts or so-called stockings which have usually been made of cotton flannel. Under the continuous flow of stock therethrough, and especially when the stock is coarse, these cloth spouts or stockings wear out very rapidly. A closely woven cloth, such as cotton flannel, has, however, been found very satisfactory for confining finely ground material, such as flour.

In accordance with my invention, I employ a closely woven cloth, such as cotton flannel, or other suitable flexible material, which is impervious to fine dust, as an outer spout or covering, and within the same I provide a flexible sectional spout preferably of light sheet metal. This inner tube takes the wear of nearly the entire flow of material, while the outer tube provides a dust tight casing and properly conducts whatever small amount of material may escape outward through the inner tube.

In the accompanying drawings, wherein like characters indicate like parts throughout the several views, I have shown the improved spout designed for use in connection with a gyratory sifter, either to direct material thereto or therefrom.

Referring to the drawings; Figure 1 is a view, chiefly in elevation but with some parts sectioned and some parts broken away, showing the improved spout applied in working position. Fig. 2 is a section taken on the line x^2 x^2 of Fig. 1, some parts thereof being broken away. Fig. 3 is a vertical section, taken on the line x^3 x^3 of Fig. 1; and Fig. 4 is a horizontal section, taken on the line x^4 x^4 of Fig. 1.

For the purposes of illustration, we will assume that the numeral 1 indicates the bottom of a conveyer or "lazyboard", and that the numeral 2 indicates the top plate of a gyratory sifter box, the said parts having, respectively, feed passages 3 and 4.

The numerals 5 and 6 indicate concentric annular metal collars or sleeves, the flanged upper ends of which are rigidly secured to the "lazyboard" 1. The collar 5 depends from and immediately surrounds the passage 3; while the collar 6 extends outward thereof and is preferably formed with a beaded lower edge 7.

The flanged lower edge of a collar or sleeve 8 is secured to the top of the sieve box 2 and immediately surrounds the passage 4 thereof.

The numeral 9 indicates the flexible outer tube which, as above stated, is preferably of cotton flannel. The upper end of this flexible tube 9 telescopes over the depending collar 6; while the lower end thereof telescopes over the upturned collar 8, the upper edge of the latter being preferably formed with a bead 10. The ends of said flexible tube 9 are securely but detachably clamped onto the said collars 6 and 8 preferably by buckle-equipped straps 11.

The flexible sectional inner tube, as shown in the drawings, is made up of a multiplicity of tapered sheet metal tube sections 12, and an upper end coupling sleeve 13. This upper end coupling sleeve 13 telescopes around the collar 5, and is detachably locked thereto, preferably by bayonet joints, as shown, afforded by pins 14 on said collar 5 that engage annular slots 15 in the said sleeve 13. To lock the sleeve 13 against rotation, in respect to the collar 5, when the two parts are connected by the said bayonet joints, a leaf spring 16 is attached to the former and is provided with a perforation through which one of the pins 14 is adapted to project, as shown in Figs. 1 and 4. At their lower ends, the tapered sections 12 and the sleeve 13 are provided with rigidly secured hoops 17 that surround the same, the extreme lower end portions of the said sections being preferably turned outward and under the said hoops. These hoops 17 are prefer-

ably constructed of non-metallic and slightly pliable material, such as wood or leather. Similar hoops 18, which rest one on each of the said hoops 17, are applied to the upper ends of the sections 12, the extreme upper ends of the said sections being preferably turned inward and over the said hoops 18. The obvious purpose of tapering the sections 12 is to permit the proper engagement of the hoops 17 and 18 and the proper overlapping of the said sections 12 without increasing the diameter of the inner tube in a direction from the top toward the bottom.

To prevent the lower end of the lower tube section 12 from flopping around within the outer tube 9, or within the lower collar 8, a suitable skeleton spacing device is applied to the said collar 8. This skeleton spacing device, as shown and preferably constructed, comprises a thin zig-zagged metal band 19, the outwardly extended angle portions of which are riveted, soldered, or otherwise rigidly secured to the said collar 8. To the inwardly extended angle portions of the said zig-zagged band 19, a thin metal ring 20 is secured. The inner surface of this ring 20 is preferably lined with a band 21 of leather, or similar pliable material, which will reduce to a minimum the wear on the lower end of the lower section 12, and which will also prevent noise, due to contact therewith.

The spout above described is flexible in all directions, so that it will adapt itself to any kind of a gyratory or vibratory motion of either of the parts 1 and 2 in respect to the other. Under gyratory motion of one of the said parts in respect to the other, there will, of course, be a slight oscillatory rocking motion of the engaged hoops 17 and 18, and for this reason, there may be a slight leakage of flour, or other fine material, outward through the joints of the inner tube, but this will be caught by the outer tube or stocking and will be directed downward with the main body of material through the passage 4. Approximately the entire wear, due to the flow of material through the spout, will be taken on the metallic sections of the inner tube. Hence, this improved spout will, even under hard usage and even where coarse material is handled, last for a very long time. As has already been indicated, this improved spout is not limited to any particular use, but is capable of general use wherever a flexible delivery spout is required.

Where the bodies connected by the spout are given straight line reciprocating motion, one in respect to the other, the rigid sections of the flexible inner tube may simply be connected for pivotal movement, one on the other.

What I claim is:—

1. The combination with upper and lower bodies, one of which is capable of movement in respect to the other, of a pair of concentric annular collars on said upper part, a collar on said lower part, a flexible outer tube connecting the outer collar of said upper part to the collar of said lower part, a centering ring secured within but spaced apart from said lower collar, and a yieldingly mounted inner tube loosely connected to the inner sleeve of said upper part, and to the centering ring of said lower part, substantially as described.

2. The combination with upper and lower bodies one of which is capable of movement in respect to the other, a pair of concentric annular collars on the upper part and a collar on the lower part, of a flexible spout comprising a flexible outer tube detachably connected to the collar of said lower part and to the outer collar of said upper part, and an inner tube made up of flexibly connected metallic sections flexibly connected to each other and detachably connected to the inner collar of said upper part.

3. The combination with an upper member having concentric inner and outer collars, and a lower member having a collar, one of which collars is capable of movement in respect to the other, the said lower collar having a skeleton tube spacing member, of a flexible tube comprising an outer tube of flexible material detachably connected to the collar of said lower member and to the outer collar of said upper member, and an inner tube made up of metallic sections flexibly connected to each other, the upper section thereof being detachably interlocked to the inner collar of said upper member, and the lower section thereof being held in position by said skeleton tube spacing device.

4. The combination with upper and lower members both having stock passages, and one of which is capable of movement in respect to the other, of a flexible outer tube connecting the stock passages of said two members, and a yieldingly mounted inner tube arranged to deliver the body of stock from the passage of the upper to the passage of the lower member, the said inner and outer tubes being spaced apart to form an annular chamber which has a discharge passage that opens at its bottom into the stock passage of the lower member, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

LEWIS V. RATHBUN.

Witnesses:
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