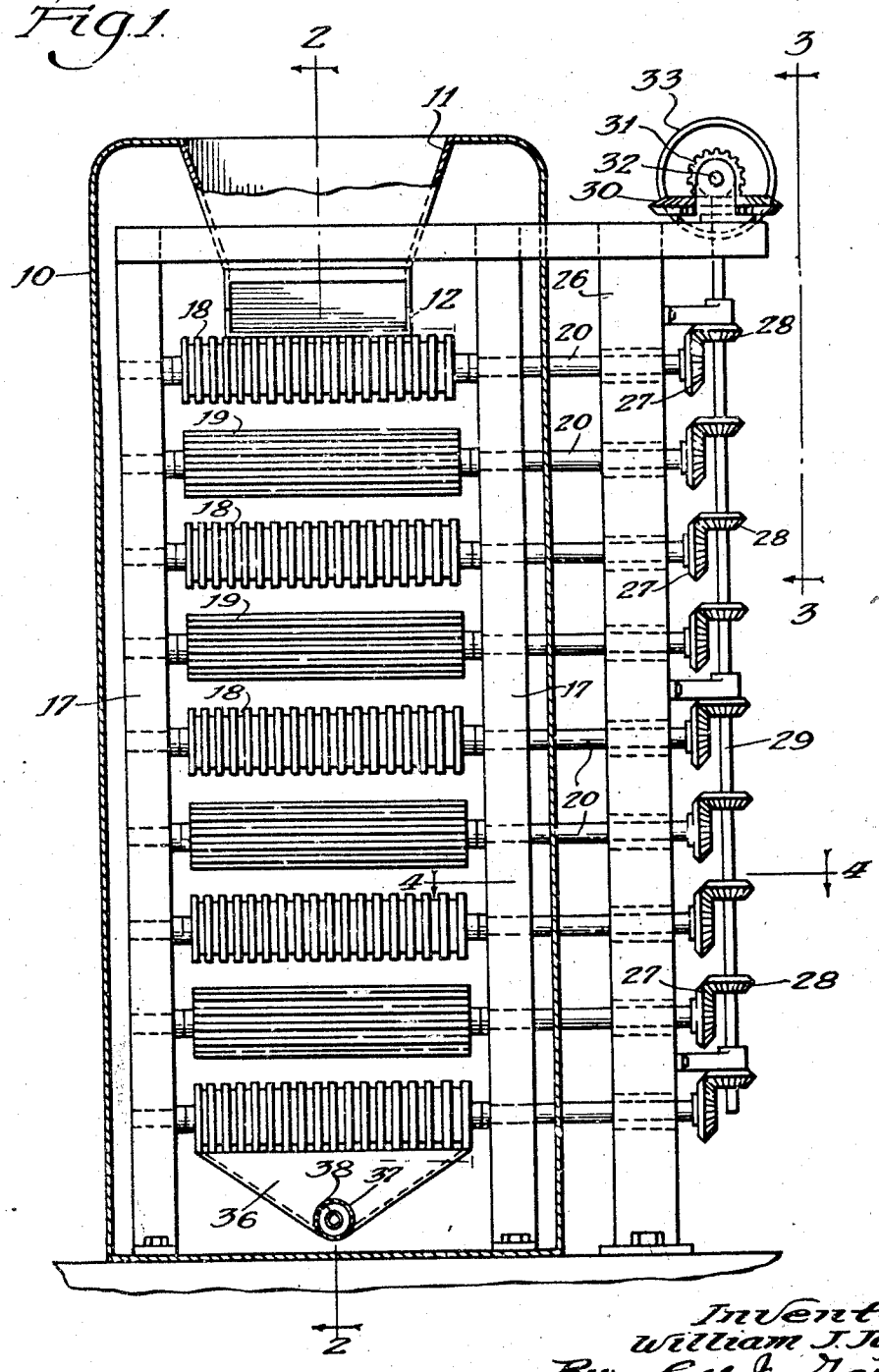
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ASBESTOS FIBERIZING APPARATUS

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Fig. 1.



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Fig. 2.

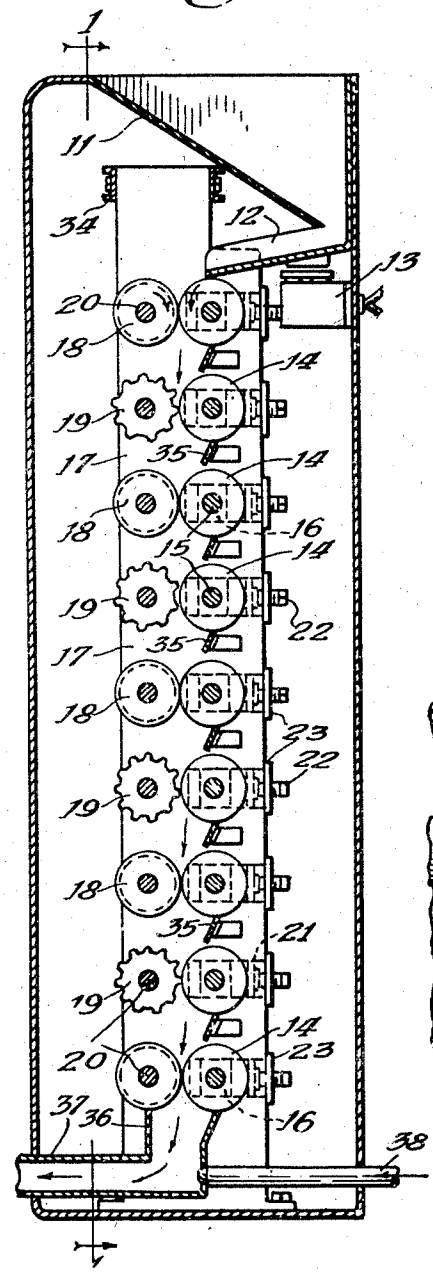


Fig. 3.

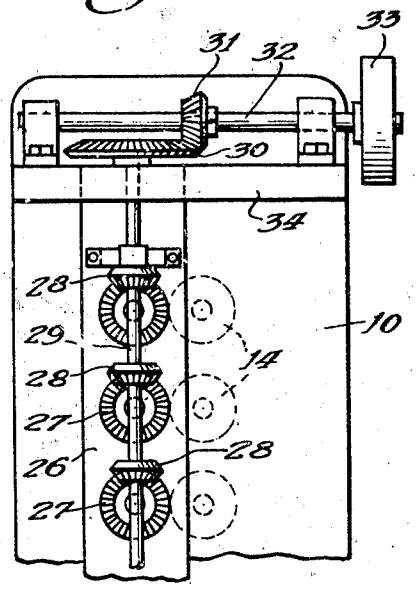


Fig. 4.

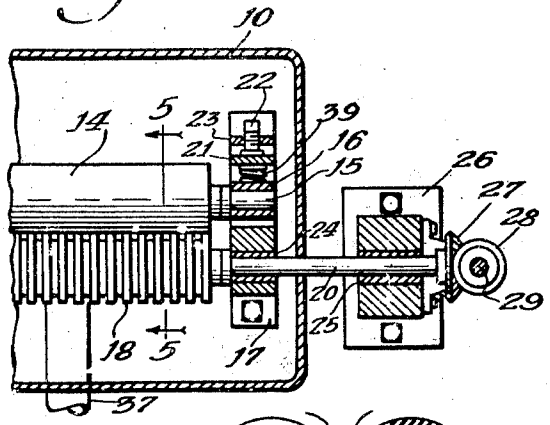
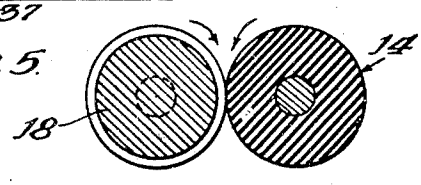


Fig. 5.



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Fig. 6.

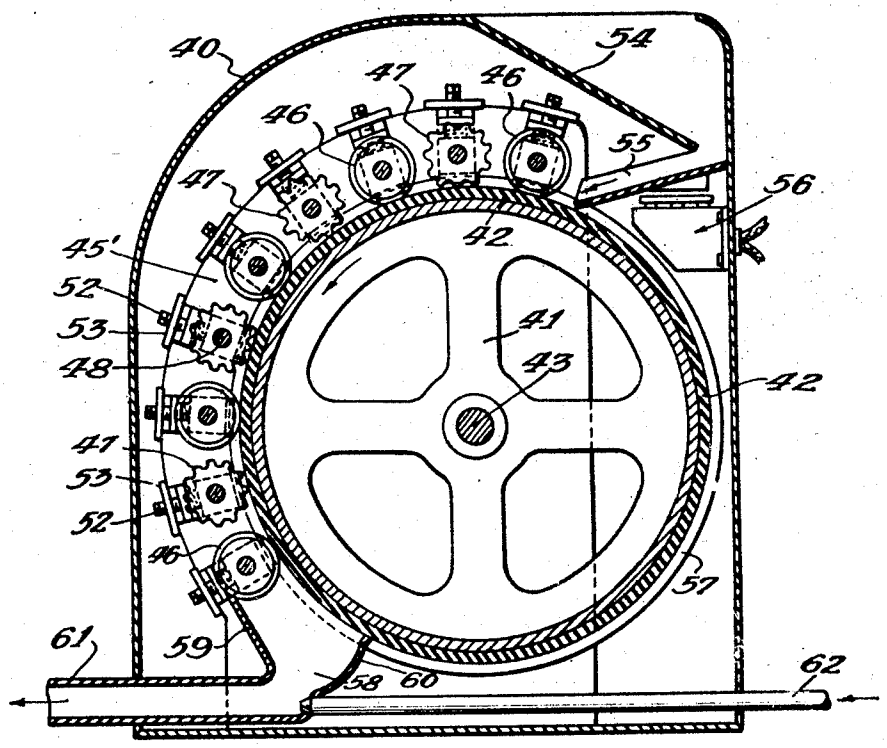
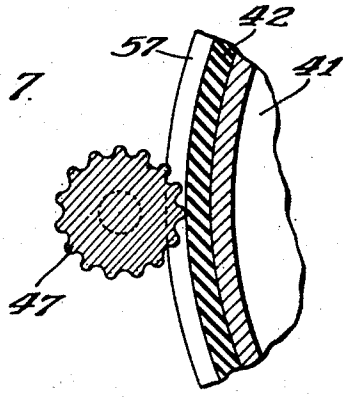


Fig. 7.



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ASBESTOS FIBERIZING APPARATUS

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Fig. 8.

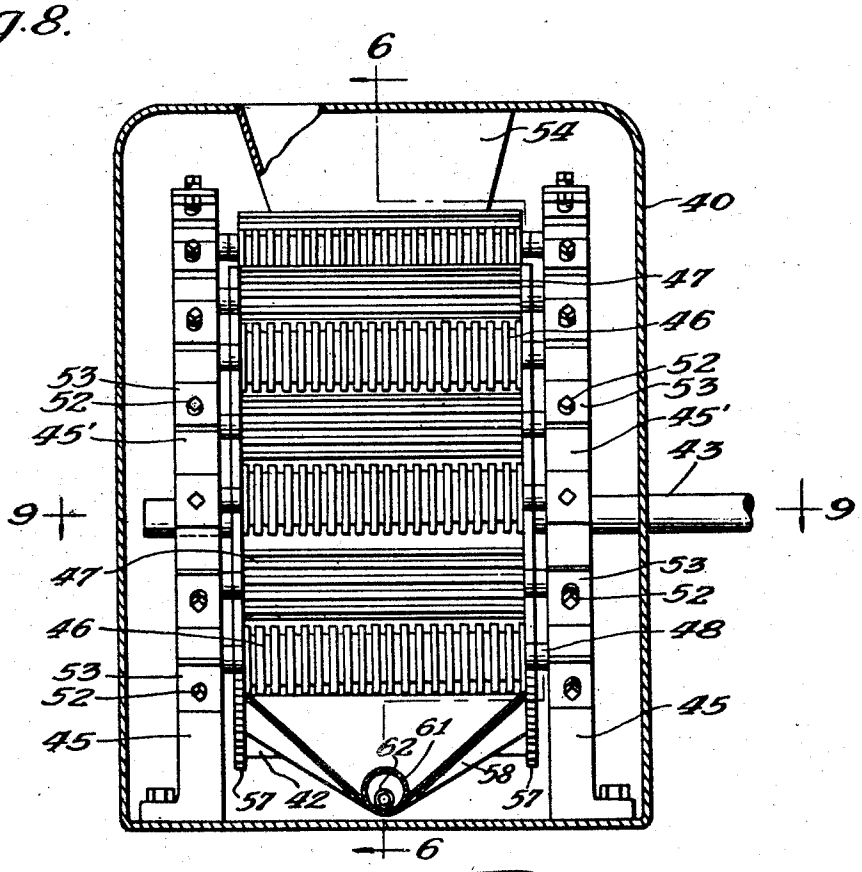
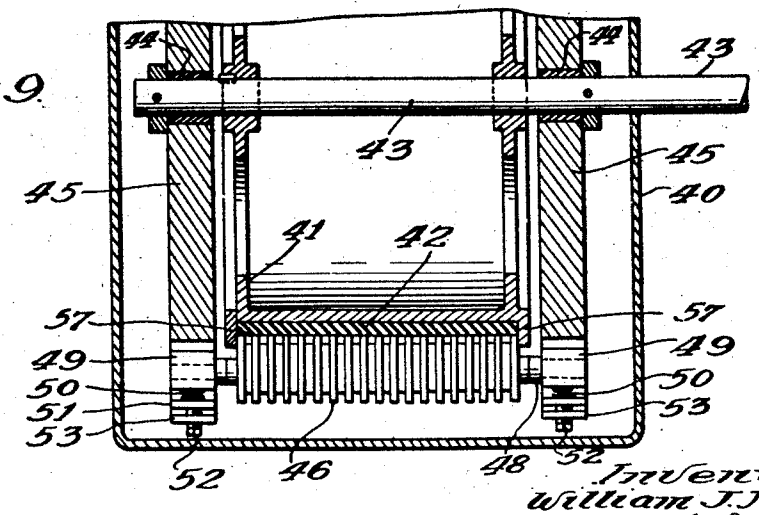


Fig. 9.



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UNITED STATES PATENT OFFICE

2,417,599

ASBESTOS FIBERIZING APPARATUS

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Application January 27, 1944, Serial No. 519,894

5 Claims. (Cl. 19—65)

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This invention relates to improvements in apparatus for reducing particles of asbestos to individualized fibrous form.

It is an object of this invention to fiberize asbestos in a manner whereby crude asbestos is effectively opened to provide a maximum amount of fibres of good length and to avoid undue shearing or damage to the fibres during progressive passage through the apparatus and attendant loss or waste.

In general the apparatus of my invention comprises a plurality of spaced horizontally supported rolls alternately provided with longitudinally and circumferentially extending rigid ribs, the ribbed rolls being aligned to act successively on the asbestos during its passage through the apparatus in cooperative relationship with juxtaposed jointly movable resilient surfaced means, such as for example one common or a like number of rubber surfaced rolls. In this manner the crude asbestos is progressively and alternately subjected to cushioned pressure and flexure in the direction of its movement and transversely thereto, as distinguished from shearing, and as a result injury to the fibre, shortening of fibre length, and undue production of fines and dust is greatly reduced.

Other objects relate to the construction of the apparatus and the arrangement of parts in my illustrated preferred form of construction whereby only one of the juxtaposed moving or rolling surfaces is positively driven and the other driven through frictional yielding engagement, which likewise is conducive to preservation of good fibre length and is of considerable economy in the construction and operation of the apparatus.

Further objects and advantages will be apparent from a consideration of the following specification and drawings, wherein:

Fig. 1 is a sectional elevation of one form of my apparatus viewed on the line 1—1 of Fig. 2.

Fig. 2 is a sectional elevation taken on the line 2—2 of Fig. 1.

Fig. 3 is a fragmentary end elevation viewed on the line 3—3 of Fig. 1.

Fig. 4 is a fragmentary transverse section on the line 4—4 of Fig. 1.

Fig. 5 is a sectional detail taken on the line 5—5 of Fig. 4.

Fig. 6 is a sectional elevation of a modified form of apparatus taken on the line 6—6 of Fig. 8.

Fig. 7 is a fragmentary sectional detail of one of the ribbed rolls and the resilient surfaced roll of the form of apparatus of Fig. 6.

Fig. 8 is a front elevation of the apparatus of Fig. 6 with a section through the housing.

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Fig. 9 is a fragmentary section taken on the line 9—9 of Fig. 8.

Referring to the drawings, the form of apparatus illustrated in Figs. 1 to 5 comprises a housing 10 within which are positioned a plurality of pairs of rolls aligned to act successively on the asbestos introduced through hopper 11 and chute 12, the latter being provided with suitable vibrating mechanism, diagrammatically indicated at 13 and preferably in the form of an electromagnetic vibrator, to aid in providing a steady flow or blanket of asbestos to the nip of the first pair of rolls. One roll 14 of each pair is of smooth cylindrical form and composed of, or surfaced with, rubber or similar rubber-like or rubbery resilient material. These rolls 14 are vertically aligned and spaced from each other, their shafts 15 being endwise journalled in bearing blocks 16 slidably mounted in guideways provided on the frame standards 17—17. Each roll 14 is held in yieldable and adjustable frictional engagement with one of its companion ribbed rolls 18 or 19 by suitable spring pressed means such as the spring 39 positioned between the bearing block 16 and the spring seat 21 slidable in the bearing guideway, the latter being adjustable by means of the screw 22 threaded through the guideway cap 23. If desired spring 39 may be omitted and screw 22 permitted to press spring seat 21 directly against bearing block 16.

The second roll of each pair is composed of rigid material, such as metal, and is provided with like rigid ribs, alternate rolls 18 and 19 being provided with circumferentially and longitudinally extending ribs, respectively. The rolls 18 and 19 are likewise mounted in vertical spaced relation with their shafts 20 fixedly journalled in the frame standards 17—17 within suitable bearings 24. One end of each of the shafts 20 extends through the side wall of the housing 10, this outer end portion being further journalled in a bearing 25 supported in the upright 26, and carries at its outer end a beveled crown gear 27. Each of the gears 27 meshes with a beveled pinion gear 28 secured to the vertical common drive shaft 29, the latter being driven through the beveled gears 30, 31, shaft 32 and pulley 33 supported from the transverse member 34. By causing the ribbed rolls 18 and 19 to be driven in a clockwise direction, crude asbestos introduced to the hopper 11 will be caused to progressively pass between each roll pair and be progressively acted upon and fiberized as previously described. Although not illustrated, means may be provided for positively driving rolls 14 also.

As indicated in Fig. 2, a scraper 35 may be positioned to act against the surface of each resilient roll 14, inclined towards the nip of the next lower roll pair, to remove surface accumulation and to aid in guiding progressive movement of the asbestos. Instead of scraper 35 a vibrating or rotating beater, not illustrated, may be used to remove surface accumulations of the asbestos. The fiberized asbestos leaving the nip of the lowermost roll pair passes to the funnel 36 and is blown outwardly through the conduit 37 by means of air introduced through the line 38, which serves not only to remove the fiberized material but also to fluff up the fibres and separate them further.

The form of my invention illustrated in Figs. 6 to 9 comprises a housing 40 within which there is mounted a roll 41 of relatively large diameter provided with a smooth cylindrical rubber or the like resilient surface 42. The shaft 43 of roll 41 is journaled in the bearings 44 in the standards 45. One end of shaft 43 extends outwardly of housing 40 and is thereat connected to or engaged by suitable driving means, not shown, to rotate roll 41 in a counterclockwise direction, in the illustration.

A plurality of spaced rolls 46 and 47 positioned parallel to each other and to roll 41 and of relatively smaller diameter, all composed of a rigid material such as metal and alternately provided with circumferentially and longitudinally extending rigid ribs, are supported in juxtaposed relation to a forwardly and downwardly moving peripheral portion of roll 41 for successively acting therewith on the crude asbestos to fiberize it during its passage through the apparatus, in the manner previously described. The rolls 46 and 47 are spaced and positioned against somewhat less than 180° of the periphery of roll 41 and the first roll may be positioned somewhat in advance of a vertical plane passing through the axis of roll 41, that is, against the still upwardly moving surface thereof.

The ribbed rolls 46 and 47 are held in yieldable and adjustable frictional engagement with the resilient surface 42 of roll 41. Each of their shafts 48 are endwise journalled in a bearing block 49 slidably mounted in radial guideways formed in the arcuate upper end portions 45'—45', of the standards 45—45. A spring 50 is positioned between each bearing block 49 and spring seat 51, the latter being adjustable by means of a screw 52 threaded through a guideway cap 53. If desired spring 50 may be omitted and screw 52 permitted to press spring seat 51 directly against bearing block 49. Although not illustrated, means may be provided for positively driving the rolls 46 and 47 also.

Crude asbestos is introduced to the housing 40 through the hopper 54 and fed to the surface of roll 41 in the direction of its rotation, and in advance of the first ribbed roll, by means of the inclined chute 55 aided by a vibrating mechanism generally indicated at 56, but which preferably is in the form of an electromagnetic vibrator whereby amplitude of vibration may be adjusted to obtain thickness of feeding desired. The asbestos is then fiberized while conveyed on the resilient surface 42 of roll 41, by being successively subjected to cushioned pressure and flexure alternately in the direction of rotation of the rolls and transversely thereto. If asbestos is fed to the full width of the roll it may be laterally confined thereon by means of roll flanges 57. After leaving the last ribbed roll the fiberized asbestos drops to the funnel generally indicated as 58 and which comprises a transverse scraper edge 59 acting against the last ribbed roll 46 and an oppositely inclined scraper edge 60 acting against the surface of roll 41. In place of the latter a vibrating or rotating beater, not illustrated, may be employed to remove surface accumulations of asbestos. From here the asbestos fibers are blown out through conduit 61 by means of a blast of air introduced through line 62, which serves not only to remove the fiberized material but also to fluff up the fibers and separate them further.

I claim as my invention:

1. An asbestos fiberizing apparatus comprising roll means including a plurality of spaced horizontally supported rolls, alternate rolls being provided with longitudinally extending rigid ribs, intervening rolls being provided with circumferentially extending rigid ribs, said ribbed rolls being aligned to act successively on the asbestos during its passage through the apparatus in cooperative relationship with juxtaposed resilient cylindrical surfaced roll means, means yieldably urging said horizontal roll means and said resilient roll means toward each other, means for positively driving at least one of said roll means, vibrating means for introducing a substantially uniform flow of asbestos to the apparatus, means for receiving the resultant fiberized material after it has passed between the roll means, and pneumatic means for removing said resultant fiberized material from said receiving means and for fluffing up the fibers and separating them further.

2. An asbestos fiberizing apparatus comprising a plurality of pairs of rolls aligned to act successively on the asbestos during its passage through the apparatus, one roll of each pair being provided with a resilient cylindrical surface, alternate companion rolls of said pairs being provided with longitudinally extending rigid ribs, and intervening companion rolls of said pairs being provided with circumferentially extending rigid ribs.

3. An asbestos fiberizing apparatus comprising a plurality of vertically spaced horizontally supported pairs of rolls aligned to act successively on the asbestos during its passage through the apparatus, one roll of each pair being provided with a resilient cylindrical surface, alternate companion rolls of said pairs being provided with longitudinally extending rigid ribs, and intervening companion rolls of said pairs being provided with circumferentially extending rigid ribs, means yieldably urging one roll of each pair toward its companion roll, and means for driving said rolls.

4. An asbestos fiberizing apparatus comprising a plurality of pairs of rolls aligned to act successively on the asbestos during its passage through the apparatus, one roll of each pair being provided with a resilient cylindrical surface, alternate companion rolls of said pairs being provided with longitudinally extending rigid ribs, and intervening companion rolls of said pairs being provided with circumferentially extending rigid ribs, said resilient rolls being in spaced vertical alignment, said ribbed companion rolls being in juxtaposed spaced vertical alignment, means for driving said ribbed companion rolls, and means yieldably urging said resilient rolls toward their ribbed companion rolls for rotation thereby.

5. An asbestos fiberizing apparatus comprising roll means including a plurality of spaced horizontally supported rolls, alternate rolls being pro-

vided with longitudinally extending rigid ribs, intervening rolls being provided with circumferentially extending rigid ribs, said ribbed rolls being aligned to act successively on the asbestos during its passage through the apparatus in cooperative relationship with juxtaposed resilient cylindrical surfaced roll means, means yieldably urging one of said roll means toward the other, means for positively driving at least one of said roll means, means for receiving the resultant fiberized material after it has passed between the roll means, and pneumatic means for removing the resultant fiberized material from said receiving means and for fluffing up the fibers and separating them further.

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