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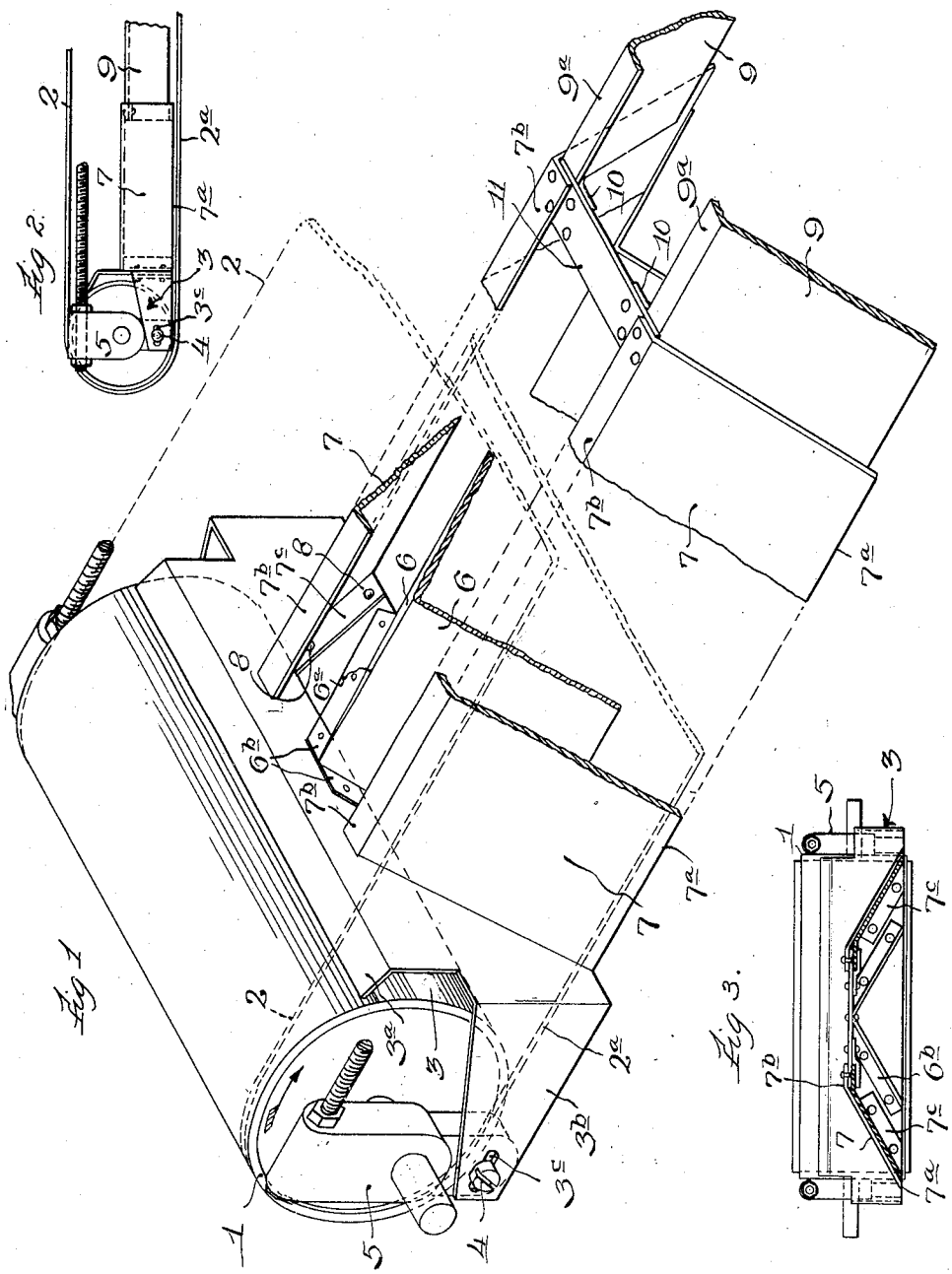


Fig 1

Fig 2.

Fig 3.

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SCRAPER AND DEFLECTOR FOR BELT PULLEYS

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This invention relates to improved scraper means for cleaning the drum or pulley of a belt conveyer, and its object is not only to remove adherent material from the face of the pulley, but also to insure that when removed the material shall be discharged entirely clear of the belt and associated mechanism. The invention consists in certain features and elements in combination as herein shown and described and as indicated by the claims.

In the drawings:—

Figure 1 is a perspective view of a pulley fitted with a scraper and a deflector embodying this invention, the framing of the conveyer being omitted and the position of the belt being indicated in dotted outline.

Figure 2 is a side elevation of the structure shown in Figure 1.

Figure 3 is an end elevation of the deflector and scraper looking toward the pulley and with the conveyer belt omitted.

The cleaning scraper which is the subject of this invention is designed particularly for use on belt pulleys employed in conveyers for handling sand, gravel, clay and the like, which is often wet and sticky. Particles of such material tend to spill from the upper or lower carrying ply of the belt onto the inner surface of the lower ply and are thus carried into contact with the drum or pulley over which the belt runs. Any considerable accumulation of such material on the pulley, of course, increases the tension in the belt and is also likely to cause the belt to run out of its proper position on the pulley; it is, therefore, desirable to keep the pulley as clear of such material as possible.

In Figure 1 the pulley is shown at 1 as a cylindrical drum and the position of the belt is indicated in dotted lines at 2. Between the upper and lower plies of the belt, 2, a scraper blade, 3, extends in contact with the pulley, 1, substantially throughout its length, the marginal portion, 3^a, which carries the scraping edge being bent at an angle to the body of the member, 3. Said member is formed with end portions, 3^b, bent at right angles to the main body and extending past the ends of the pulley, 2, for support on screws, 4, which project from portions of the bearing blocks, 5, in which the pulley is journaled. As indicated by the arrow, the pulley, 1, turns toward the edge of the scraper, 3, so that any adherent or incrusted material on the pulley surface will be removed and will fall over the surface of the member, 3, toward the lower ply of the belt indicated at 2^a.

Extending longitudinally from the scraper, 3, between the upper and lower plies of the belt, 2, I provide laterally inclined sheds whose ends abut the surface of the scraper, 3, and are secured thereto. At about the middle of the width of the scraper, 3, I attach the middle shed which consists of two plane portions, 6, 6, which may be integral with each other and which slope downwardly from opposite sides of the ridge line, 6^a, at which they are joined. Attaching flanges, 6^b, are folded up from the ends of the parts, 6, and secured against the surface of the scraper member, 3, by suitable bolts or rivets as shown. This junction line meets the scraper, 3, only a short distance below its marginal portion, 3^a, so that any material removed by the scraper blade from the middle portion of the pulley, 1, will fall onto one or the other of the inclined parts, 6, and by sliding or rolling over the latter will be carried laterally toward the edges of the belt.

However, as shown in Figure 1 the belt is somewhat wider than the distance between the lower edges of the shed members, 6, 6, so that this material will be delivered onto the lower ply, 2^a, of the belt. If the vibration of the machinery does not cause such material to be tumbled off the belt at its edges, it may be carried around the pulley, 1, once more by reason of adhering to the belt in the vicinity of its lateral margins. If on this occasion the material is transferred to the surface of the pulley, 1, it will be once mort removed by the scraper, 3, and this time will fall over the surface of the scraper blade onto one of the outer sheds, 7, which are inclined substantially parallel to the divergent shed members, 6, 6, at laterally separated positions, so that their lower edges, 7^a, extend outside the edges of the lower ply, 2^a, of the belt and their upper edges overhang the lower

edges of the shed members, 6. The upper edges of the shed, 7, are preferably bent to form substantially horizontal marginal portions, 7^b, and the ends which abut the scraper member, 3, are bent to form flanges, 7^c, through which securing rivets, 8, may be inserted for attaching the sheds to the member, 3. It will be seen that material falling onto the inclined sheds, 7, will slide or roll down them and be delivered clear of the belt, 2; thus the particles which originally adhered to the middle portion of the pulley, 1, are moved progressively outward by the series of sheds and the repeated action of the scraper blade. It will be evident that for still wider belts additional sheds similar to those shown at 7 may be provided. By this system, although some accumulations of material are allowed to adhere temporarily to the pulley surface, there is no opportunity for these to build up sufficiently to interfere with the proper operation of the mechanism.

To protect the lower ply, 2^a, of the belt from spillage as much as possible, the conveyer may be built with fixed sheds, 9, overhanging the edges of the belt. These sheds serve conveniently to support the ends of the sheds, 7, which are remote from the pulley, 1, and preferably the connection is made sliding or telescopic by lapping the parts, 7, over the parts, 9, and attaching guide lugs, 10, to a connecting cross-bar, 11, so that said lugs may reach under the bent margins or flanges, 9^a, of the fixed sheds. The parts, 3^b, of the scraper member engage the screws, 4, by means of slots, 3^c, which permit of limited adjustment of the scraper and deflector assembly in the direction of extent of the belt for taking up wear on the scraper blade, or setting it more or less tightly against the surface of the pulley, 1, the screws, 4, serving as clamps to fix the parts in adjusted relation.

The scraper and deflector apparatus as herein described is especially adaptable for use with belt conveyors of the portable type, in which the head and foot pulleys must be relatively small in diameter to provide essentially a light weight compact apparatus. In scraping adhesive materials such as wet clay, sand, etc., off the face of the pulley, it is necessary that the deflector chute or shed be inclined at a relatively steep angle in order to overcome the adhesive tendency of the material from adhering thereto. But with limited vertical space between the upper and lower plies of the belt a single sufficiently steep shed would not extend laterally over the edge of the lower ply, hence, a plurality of sheds are employed in serial arrangement, as already described. It will be understood that any number of chutes or sheds may be employed, depending on the width of belt, in order that the material may be gradually shifted laterally by the sheds to the adjacent outer shed until it is finally discharged clear of the belt.

I claim:—

1. In combination with a belt pulley, a scraper extending in contact with the pulley between the upper and lower plies of the belt thereon, and downwardly sloping shed surfaces extending from said scraper longitudinally of the belt diverging from the plane of its center line, said sheds including an inner set terminating downwardly above the lower ply of the belt and an outer set terminating beyond the lateral margins of said lower ply for final discharge of material picked up by the scraper.

2. In the combination defined in claim 1, the upper edges of said outer set overhanging the lower edges of the inner set of sheds for the purpose specified.

3. In the combination defined in claim 1, the inner sheds being joined together at their upper edges.

4. In combination with a belt pulley and a conveyer belt thereon, fixed sheds extending between the upper and lower plies of the belt sloping downwardly over the lateral margins of said lower ply, together with a scraper extending in contact with a pulley between the upper and lower plies of the belt, and downwardly sloping sheds attached to the scraper extending longitudinally of the belt and overhanging the edges of its lower ply, said sheds overlapping the fixed sheds and slidably engaging them together with supporting arms for the scraper, and means adjacent the pulley to which they are attached for adjustment of the scraper toward and from the pulley surface.

5. In combination with a belt pulley and a conveyer belt thereon, a scraper extending in contact with the pulley between the upper and lower plies of the belt thereon, and a plurality of sheds extending from the scraper over the lower ply of the belt sloping downwardly and laterally with respect to the belt, adjacent sheds overhanging adjacent portions of the belt width and one of said sheds extending beyond a lateral margin of the belt.

6. In combination with a belt pulley and a conveyer belt thereon, a scraper extending in contact with the pulley between the upper and lower plies of the belt, and a plurality of sloping sheds extending from the scraper over the lower ply of said belt in substantially parallel relation to each other, and positioned so that adjacent sheds overhang overlapping portions of the belt width.

7. In combination with a pulley and a conveyor belt thereon, a scraper extending in contact with the pulley between the carrying and return runs of the belt, deflector means including inner and outer sheds disposed parallel to each other and connected together in spaced relation, said sheds being attached to the scraper and bodily movable therewith as a

unit, each of said sheds including a pair of oppositely extending laterally and outwardly sloping surfaces, the lower edges of the surfaces of the inner shed terminating within the lateral edges of the adjacent surfaces of the outer shed, the lower edges of the outer shed extending beyond the lateral margin of the belt, whereby material removed from a middle portion of the pulley is discharged laterally by the inner shed and is again carried by the belt onto the face of the pulley at a point laterally adjacent the middle portion, where it is again dislodged by the scraper and directed by the inclined surfaces of the outer shed in a lateral direction clear of said belt.

8. The combination with a belt pulley and a conveyor belt thereon, a scraper extending lengthwise of said pulley, and a plurality of similarly inclined sheds connected to said scraper, one of said sheds extending beyond on outer margin of said belt.

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