No. 884,449. PATENTED APR. 14, 1908.

A. WILLIMANN & P. HECHT.

SACK CLEANING AND TURNING APPARATUS.

APPLICATION FILED JUNE 21, 1907.

4 SHEETS—SHEET 1.

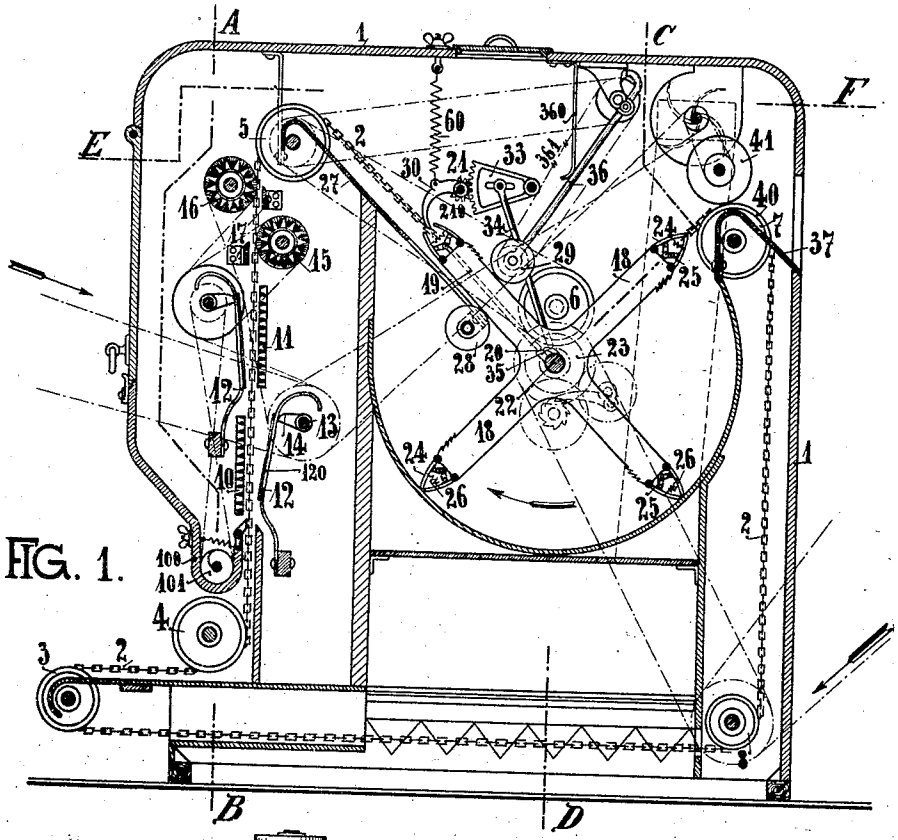


FIG. 1.

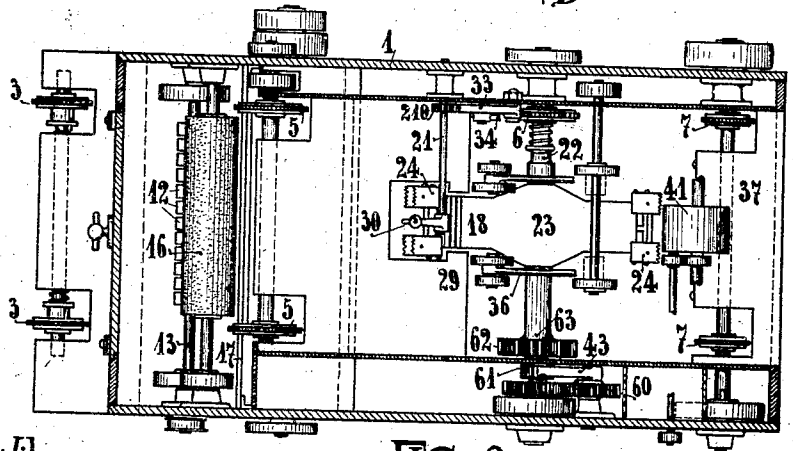


FIG. 2.

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S. Ford

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Peter Hecht

per: R. Haddan

Attorney

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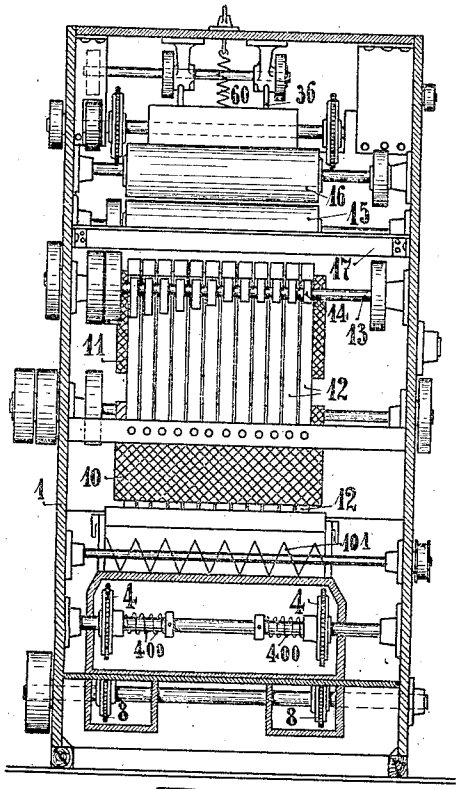


FIG. 3.

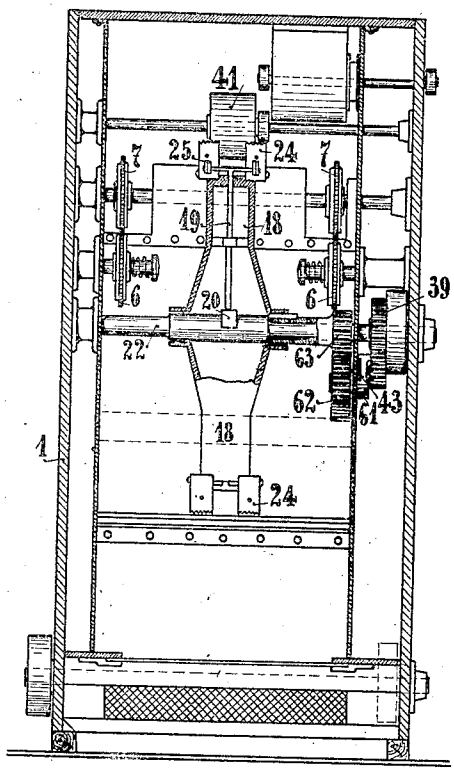


FIG. 4.

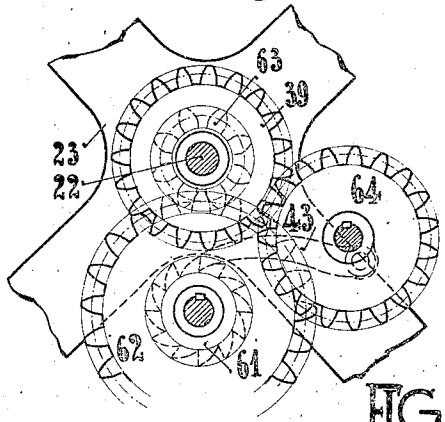


FIG. 6.

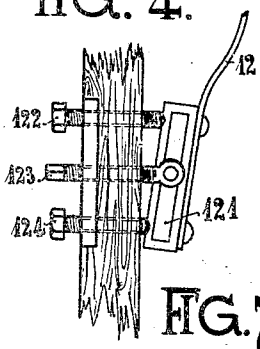


FIG. 7.

Witnesses:

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4 SHEETS—SHEET 3.

FIG. 13.

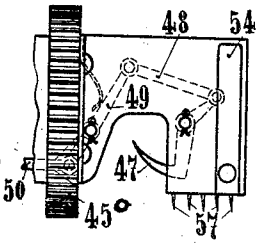


FIG. 14.

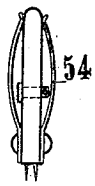


FIG. 11.

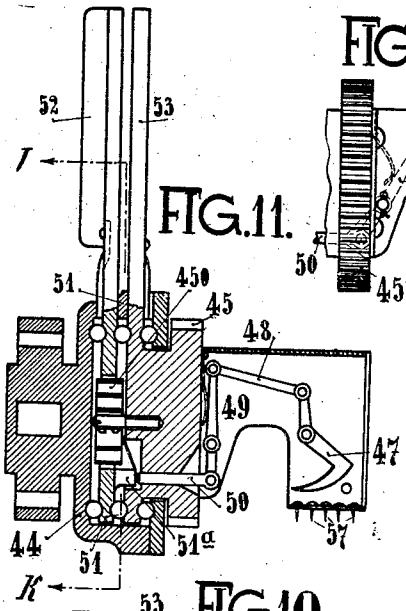


FIG. 12.

FIG. 10.

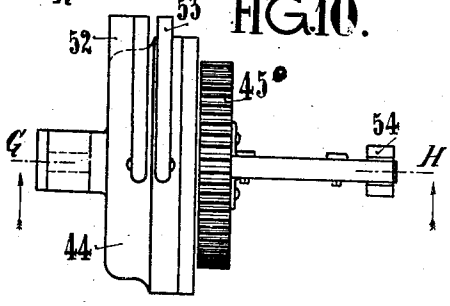


FIG. 5.

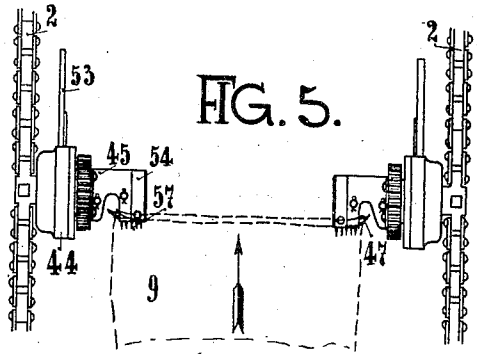


FIG. 9.

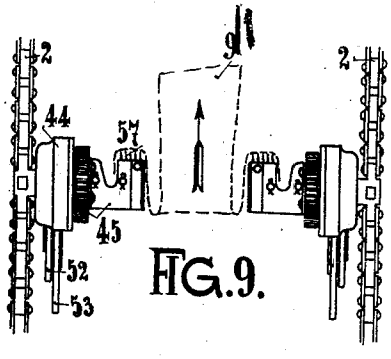
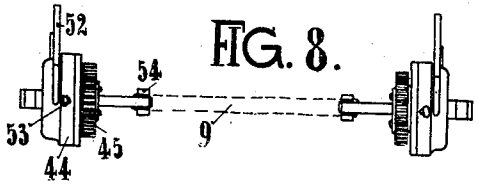


FIG. 8.



Witnesses:

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No. 884,449.

PATENTED APR. 14, 1908.

A. WILLIMANN & P. HECHT.

SACK CLEANING AND TURNING APPARATUS.

APPLICATION FILED JUNE 21, 1907.

4 SHEETS—SHEET 4.

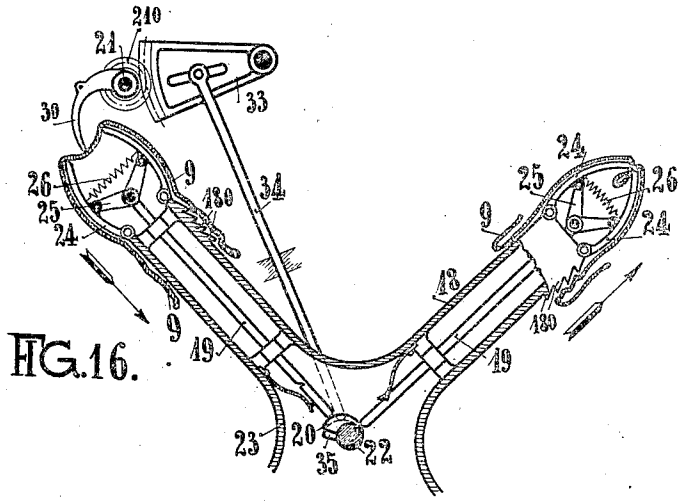


FIG. 16.

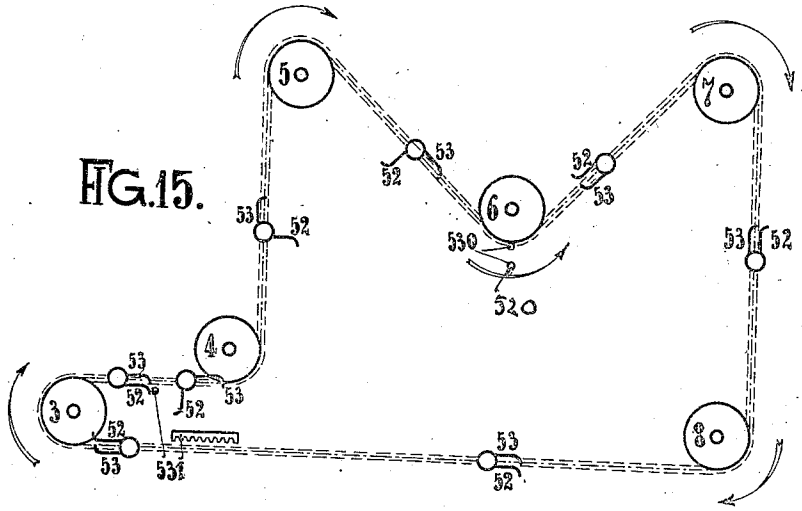


FIG. 15.

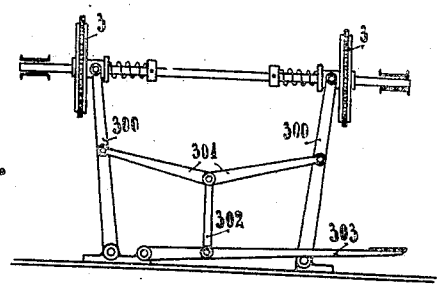


FIG. 17.

Witnesses:

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UNITED STATES PATENT OFFICE.

ANTON WILLIMANN AND PETRUS HECHT, OF GOSSAU, SWITZERLAND.

SACK CLEANING AND TURNING APPARATUS.

No. 884,449. Specification of Letters Patent. Patented April 14, 1908.

Application filed June 21, 1907. Serial No. 380,131.

To all whom it may concern:

Be it known that we, ANTON WILLIMANN and PETRUS HECHT, citizens of the Swiss Republic, residing at Gossau, canton Saint Gallo, Switzerland, have invented a Sack Cleaning and Turning Apparatus, of which the following is a specification.

This invention relates to a machine for beating and brushing sacks conveyed through the machine by endless parallel chains. The novelty of the machine resides in the provision of means whereby the sacks are automatically turned inside out and conveyed out of the machine after they have been beaten and brushed on both sides. In the sack turning apparatus hitherto known each individual sack must be drawn by hand on to a reciprocating carriage or slide, but in the improved machine the sacks are automatically turned and removed by the continuously moving chains. The improved machine allows of working without interruption and of successively cleaning sacks of different widths without altering the adjustment of the sack turning mechanism.

A construction embodying the invention is illustrated in the annexed drawing, in which

Figure 1 is a vertical longitudinal section of the machine. Fig. 2 is a horizontal section on the line E—F of Fig. 1. Figs. 3 and 4 are vertical sections on the lines A—B and C—D of Fig. 1, and Fig. 5 shows the sack holding device, and Fig. 6 the mechanism for operating the turning device. Fig. 7 shows means of regulating the beaters. Fig. 8 is another view of the sack-holders, and Fig. 9 shows the manner in which the sack is held during the removal thereof from the turning device. Figs. 10 to 14 represent details, Fig. 11 being a section on the line G—H of Fig. 10, and Fig. 12 a section on the line J—K of Fig. 11. Fig. 15 diagrammatically illustrates the manner in which the holders are actuated during the passage of the sack through the machine. Fig. 16 shows part of the turning device, and Fig. 17 shows means for adjusting sprocket wheels over which the conveyer chains travel.

The parallel conveyer chains 2 2 travel over sprocket wheels 3 3, 4 4, 5 5, 6 6, 7 7 and 8 8 in the casing 1, the chains being horizontal between the wheels 3 and 4 and vertical between the wheels 4 and 5. The sacks 9 are attached to the chains at the horizontal parts and are held fast by devices which will be described hereinafter. At the sides of the ascending chain sections between the wheels 4 and 5, grates 10 and 11 are arranged at different levels, so that the sacks can be beaten thereon by means of resilient beaters 12 connected to bars 121 adjustable from outside the casing by screws 122, 123, 124 for the purpose of regulating the force with which the beaters act (Fig. 7). The beaters are actuated by shafts 13 provided with cams 14. The cams displace and then release the beaters, so that the latter beat against the sacks on the grates by virtue of their elasticity. The surfaces of the beaters are covered with leather, india-rubber or the like 120. The sacks pass first between the lower grate and lower row of beaters, and are beaten on one side, whereupon they travel past the upper grate and are beaten on the other side by the upper row of beaters. Above the upper grate 11 there are two cylindrical rotatable brushes 15 and 16, situated one above the other and adjustable relatively to boards or plates 17. Both sides of the ascending sack are brushed by these brushes, whereupon the clean sack passed to the turning device.

The turning device comprises a cross or spider 23 having four hollow arms 18 and rotatable on a shaft 22. The latter is supported by bearings in the casing 1, and is rotatable independently of the spider 23. To the outer end of each arm 18 there are hinged two finger plates 24 connected by links 25 (Fig. 16) to a rod 19 movable within the arm. A cam 20 fixed to the shaft 22 is adapted to thrust the rod outwards so that the finger plates 24 are moved apart. When the cam has cleared the rod, a spring 26 pulls the plates together again and thrusts the rod inwards.

From the brushes the sack trails downwards over an inclined plate 27 and is drawn on to one of the arms 18 of the spider 23. To accelerate the passage of the sack on to the said arm a pair of rolls 28 and 29 are arranged near the arm. The roll 28 has fixed bearings, but the roll 29 is carried by a lever 36 supported by a spring 360. The roll 29 is driven by a chain 361, and the circumferential velocity of the roll 28, 29, is greater than the velocity of the conveyer chains, so that the sack is rucked on the arm 18. When the bottom of the sack has reached the finger plates 24 the rod 19 thrusts the latter apart (Fig. 16). As soon as the sack has been placed on the arm 18 in this manner mechanism comes into action for inverting the sack. This mechanism comprises a

curved arm 30 (Figs. 1 and 16) fixed to a shaft 21 mounted in the casing in a position which enables the free end of the arm 30 to be thrust between the plates 24. To the shaft 21 is fixed a toothed wheel 210 meshing with a toothed segment 33 mounted in the casing. A rocking movement can be imparted to the said segment 33 and arm 30 by means of a rod 34 actuated by a cam 35 (Fig. 16) fixed to the shaft 22, so that the arm 30 pushes the bottom of the sack between the plates 24. The relative positions of the cams 20 and 35 on the shaft 22 are such that when the cam 20 has moved the plates 24 apart it does not clear the rod 19 until the cam 35 has thrust the arm 30 between the said plates. The rod 34 drops from the cam 35 just after the rod 19 clears the cam 20. The arm 30 is then pulled back into its normal position by a spring 60.

While the holders by which the sack is attached to the conveyer chains are traveling past the sprocket wheels 6, 6, levers 53 abut against the shaft 22 and impart a quarter of a revolution to the holders, in order to allow of removing the sack from the arm 18. At the same time the spider 23 performs a quarter of a revolution, so that the sack is rocked into the position in which it is shown at the right hand side of Fig. 16. The conveyer chains continue to travel while this is taking place, so that the sack is stripped off the arm 18 and turned inside out on the plate 37. Two rotating rolls 40 and 41, the circumferential velocity of which exceeds the velocity of the chains, accelerate the removal of the sack from the arm 18. The holders 24 retain their hold on the sack until the rolls 40 and 41 have completely turned the latter inside out. The holders are rotated through one quarter of a revolution by means of abutments in order that the sack can pass out of the machine, as will be described hereinafter. The holders travel past the wheels 8 back to that part of the machine at which the sacks are attached to the chains. The arms 18 of the spider 23 are preferably constructed as shown in Figs. 2, 4 and 16, two finger plates being hinged to each arm, and the arm being narrower directly behind the said plates, so that there is room thereon for the rucked part of the sack. During the turning or inverting of the sack the folds occupy the space thus provided. To facilitate the removal of the sack from the arm 18 in the manner intended the latter is notched as shown at 180 so that the rack does not slide back but is frictionally held while the end is drawn back as shown on the right of Fig. 16.

The intermittent rotation of the spider 23 can be produced by various means, for example by means of a toothed wheel 39 (Fig. 6) fixed to the shaft 22 and meshing with a toothed wheel 64, the latter carrying a dog 43 which intermittently actuates a ratchet wheel 61 attached to a toothed wheel 62. The latter meshes with a toothed wheel 63 fixed to the spider, and the ratio of transmission is such that each actuation of the wheel 63 causes the spider to perform exactly one quarter of a revolution.

In the construction illustrated the sack holding devices form in the usual manner links of the chains. Each of these devices comprises a box 44 containing a ball-bearing for the holding member 45. The levers 53 already referred to are fixed to the members 45. Each of the latter carries a pivoted hook 47 connected by a link 48 and lever 49 to a pin 50 adapted to be displaced by a cam 51^a, the latter being fixed to a ring 51 provided with an abutment lever 52. The parts 45 and 51 are connected to each other by a spiral spring 450. The part 45 can be rotated relatively to the box 44 and ring 51 by the abutment lever 53. The levers 52 and 53 are provided with resilient catches adapted to engage recesses in the wall of the box 44 for the purpose of retaining the levers in their end positions. Springs 54 are fixed to the members 45 for the purpose of holding open the mouth of the sack, in order to facilitate the drawing of the latter on to the arm 18.

The sack is attached to the members 45 as the latter pass along where the chains are horizontal, namely between the sprocket wheels 3 and 4, the hooks 47 being then in the position shown in Fig. 13, so that the sack can be hooked to the hooks 47 of the members 45 by hand. The chains then convey the sack to the beaters and brushes and draw it upon one of the arms 18. While this arm 18 is rocking through 90 degrees the hooks 47 are automatically withdrawn, the levers 53 being rocked through 180 degrees by means of abutment 530 (Fig. 15), and the members 45 beng rotated through 180 degrees relatively to the boxes 44. At the same time the ring 51 is rotated through 90 degrees by the lever 52 and abutment 520, so that the levers assume the positions shown in Fig. 9. The pins 50 are by this means actuated so that the hooks 47 release the sack, and the latter is at the same time engaged by prongs 57 fixed to the members 45, and is pushed off the arm 18. The levers 52 and 53 are automatically moved back to their original positions by means of racks 531 arranged between the wheels 8 and 3 and engaging gear teeth 450 on the members 45.

T oallow of easily attaching sacks of different widths to the chains the sprocket wheels 3, 3 are axially adjustable by means of the treadle-operated lever mechanism 300, 301, 302, 303 shown in Fig. 17. This mechanism allows of simultaneously and equally displacing the wheels 3, 3. The wheels 3, 3 4, 4 5, 5 6, 6 and 7, 7 are movable

on fixed axles, and springs 400 as shown in Fig. 3 tend to thrust them apart, so that the sack is kept taut between the chains. The lighter dust, flour, moths and the like beaten and brushed out of the sack is removed by means of a suction apparatus 600 shown diagrammatically, a filter being arranged in the path of the air current. Any suitable suction apparatus may be used. The flour falling from the beaters 12 is collected in a trough 100 and removed thence by a screw conveyer 101.

What we claim as our invention and desire to secure by Letters Patent of the United States is:—

1. In a sack cleaning and turning apparatus, the combination of a spider, means for giving partial rotation thereto, sack carrying devices movable in a path substantially intersecting the axis of the spider, and means at the extremity of each spider arm for engaging a sack bottom when the sack is drawn onto the spider arm.

2. In a sack cleaning and turning apparatus the combination of a spider, means for giving partial rotation thereto, sack carrying devices movable in a path substantially intersecting the axis of the spider, and means at the extremity of each spider arm for engaging a sack bottom when the sack is drawn on to the spider arm, and a finger for thrusting the sack bottom into the engaging device.

3. In a sack cleaning and turning apparatus, the combination of a spider, means for giving partial rotation thereto, sack carrying devices movable in a path substantially intersecting the axis of the spider, and means at the extremity of each spider arm for engaging a sack bottom when the sack is drawn onto the spider arm, the sack carrying devices comprising engaging hooks, means for withdrawing the engaging hooks as the devices pass the axis of the spider, and teeth on the sack carrying devices adapted to strip the sack from the spider arm.

In witness whereof we have signed this specification in the presence of two witnesses.

ANTON WILLIMANN.
PETRUS HECHT.

Witnesses:
HERNANDO DE SOTO,
KONRAD WOLFENDER.