MACHINE FOR PICKING HOPS.


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To all whom it may concern:

Be it known that I, JAMES TROWBRIDGE, a citizen of the United States, and a resident of the city and county of San Francisco and State of California, have invented certain new and useful Improvements in Machines for Picking Hops, of which the following is a specification.

This invention has for its object to provide simple and practically operating machinery or appliance for removing hops from the vines, and the invention consists in certain novel parts, and combination of parts as hereinafter set forth in the following description and pointed out in the claims, producing an improved machine for picking or stripping hops from the vine.

The accompanying drawings herein referred to and forming part of this specification illustrate a machine for stripping hops from the vine, embodying my invention.

Figure 1 is an elevation in longitudinal section. Fig. 2 is a plan or top-view of Fig. 1, with some of the top-strippers omitted. Fig. 3 is a top-view, on an enlarged scale, of a section of the traveling apron, showing the construction of the same. Fig. 4 is a detail, in perspective of the top-strippers, showing the manner of supporting those parts or devices. Fig. 5 is an alternative construction of stripping-device.

The principal parts or members of the hop-stripping machine of my invention comprise an endless traveling-apron or screen a composed of wire links, and mounted on rollers b—b for traveling in one direction within a supporting-frame 2; and a number of stripping-devices f arranged over the top-surface of the screen, in groups or sets, and adapted to yield to the pressure of the vines so as to let the latter pass under the strippers in being carried forward; and of catching and pulling off the hops in the stripping operation. These parts are mounted for operation in a stationary frame-work composed of rails and uprights 2—3 stiffly put together and braced.

The traveling-screen a is mounted on rollers b—b, one at each end of the frame, and is supported by a number of idle rollers d placed at intervals apart under upper or working side of the screen. Power is applied to one of the rollers b through the medium of a pulley e fixed on the shaft of the roller to take a belt from an overhead shaft; or by any other driving means whereby the apron a will be caused to travel continuously in the same direction longitudinally in the frame. The screen may also be operated by hand-power; as for instance by providing a hand-crank of well-known character which may be connected with one of the belt-carrying rollers b by gear-wheels to increase the power. This last mentioned means is not shown in the drawings, as its application will readily be understood without requiring to be illustrated.

A novel feature in the hop-stripping machine of my invention consists in an endless traveling screen formed of loosely joined links or wire elements so shaped and joined together as to produce lozenge-shaped openings presenting their acute angles at intervals apart in the direction of the travel of the screen and in rows extending transversely across the screen.

As illustrated in Fig. 3 of the drawings, each one of the sections or elements composing the screen is formed of two angularly bent strands of wire 6, each bent in zig-zag form, producing a number of acute angles with a double-twisted loop or eye at the apex of each angle designated by the numerals 7 and 8. The eyes 7 along one edge of a strand are united with those, 8, along the opposite edge of an adjacent strand by the oval links or rings 10. The two bars 6 connected together by loose joints in this manner form a section or unit, in which the two angularly bent strands joined together inclose a lozenge-shaped opening, having the acute angles presented longitudinally of the screen, or in the direction of its travel. But as arranged and coupled in this manner, and by reason of the uniformity in the length and in the angles of the wire strands or members, each strand forms one side of the next section, so that the straight members thereof become in turn the sides of the next series of lozenge-shaped openings. This construction is carried out for the entire dimensions lengthwise and breadthwise of the screen; the space inclosed between the angular members composing each section being of sufficient length and breadth to allow the largest hops on the vines to drop through the openings and be caught by their stems in the angles of the strands 6. The sections of this screen are of novel construction, also, in having the eye in each formed with a double twist of the wire; the object of which is to prevent the stems from catch-
ing in the joint where the wire is crossed to form the eye.

I have found in practice that if the eye be formed by a single twist of the wire, the stems are liable to catch in the bight and be drawn through the twist into the eye. A screen of this construction composed of loosely jointed sections will be found to travel evenly and turn readily upon the carrying-rollers. It will throw off or allow the hops to pass readily through the opening while it is in motion; and while seizing and holding on to the hops, it will not grip the stems or stalks of the vines. Provision is made, however, for dislodging any hops or parts of the stems or leaves that may have been caught in the screen and carried along, by placing a revolving brush-roller \( h \) under the working surface near the rear carrying-roller. Revolving motion in the same direction as the travel of the screen, but at a much greater speed, is given to this brush \( h \) by connecting the brush-shaft with the carrying-roller shaft, through the medium of pulleys \( k-\ell \) and a belt, as seen in Fig. 2. This is a direct and simple way to drive the brush; but it may also be driven from some other part of the machine. Additional brushes may also be placed for the same purpose at different points under the screen, if found necessary or desirable.

Another novel feature in a hop-stripping machine of my invention consists in providing at different points above and in close working relation to the upper traveling surface of the screen, stripping-devices, or means for seizing and holding on to the hops that do not come directly in contact with the screen and are prevented by the stalks and leaves from being caught in the openings. These devices, which I term the "top-strippers," consist essentially of forked fingers \( f \) supported in position over the apron from hinge-joints, on which they are free to move at their outer ends in a vertical arc; each stripper having a forked outer end that is turned or presented in the direction toward which the screen is traveling, and at an angle to the surface of the screen. The forked end of the stripper is depressed and held in proper working position with relation to the surface of the screen by a spring \( g \) supported by a rod \( 5 \) over the stripper. Being held down by this spring against a stop \( p \), the strippers \( f \) are adapted to yield when a bunch of stalks or vines is drawn under the strippers.

In the operation of the machine, the top-ends of a bunch of vines are placed upon the end of the screen just back of the front carrying roller \( \delta \), and while the operator retains a firm hold on the bight end of the stalks, the vines are drawn in and carried along toward the rear end, until the vines are laid for their entire length upon the screen. During their progress, the vines are drawn under the top-strippers, which are free to rise and drop for that purpose; and finally, the vines are pulled back by the operator in the contrary direction to the moving screen, thereby stripping the vines of those hops, which are caught in the opening of the screen, and also those which are caught in the top-strippers. This operation is repeated until the vines are thoroughly stripped. The operation of removing the hops from the vines, as carried out in this machine consists, therefore, in first presenting the vines after they are cut, to the traveling screen, whereby they become attached thereto and are drawn into the machine and under the top-strippers, and afterward in pulling back the vines against the strain of the moving screen, or at the end where they were entered. The stripped hops fall through the screen upon a traveling belt or "draper" \( \ell \), which is arranged to carry them to a point of deposit outside the machine. This draper \( \ell \) is of well-known construction; being supported by rollers \( w \), and running out at the end of the frame.

Fig. 5 illustrates a slight modification of the top-stripper \( f \) in which it is formed of twisted wire, instead of sheet-metal.

Having thus described my invention, what I claim is:

1. In a machine for stripping hops, the combination of a traveling endless screen on which the vines are received, and strippers arranged above the screen and inclining downward in the direction in which it travels and having forked lower ends or edges; between which strippers and the endless screen the vines are carried, and by which strippers the hops are removed when the vines are drawn backward by hand.

2. In a machine for picking hops, the combination of a traveling endless screen on which the vines are received, and strippers arranged above the screen and inclining downward in the direction in which the screen travels, the strippers having forked lower ends and being held toward the screen with yielding force and so arranged that the vines carried by the screen are carried under the strippers and the hops are removed by the strippers whenever the vines are drawn backward against the movement of the screen.

3. In a machine for stripping hops from the vine, the combination of a traveling screen, strippers arranged above the screen comprising a plurality of separate forked members which incline downward in the direction in which the screen travels, such strippers being pivotally supported and held toward the screen with yielding force, and means for limiting the movement of the strippers toward the screen.
4. In a machine for stripping hops from the vine, the combination with an endless traveling screen of a stripping device arranged to operate above the screen, comprising a yielding member hinged at one end to a fixed support and having a forked outer end, a stop adapted to limit the movement of the outer forked end in one direction whereby the stripping device is held in a position inclining downward in the direction in which the screen travels and a spring to hold said member against the stop.

5. In a machine of the character described, the combination of an endless traveling screen, top strippers arranged above the said screen, means for permitting the strippers to yield in one direction when the vines laid on the screen are carried forward with the screen, and means for limiting the movement of the strippers in the opposite direction when the vines are pulled back over the screen.

Witnesses:

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