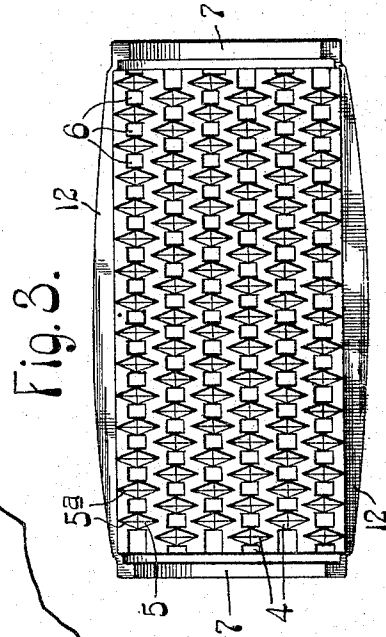
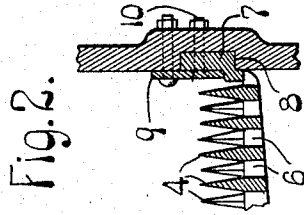
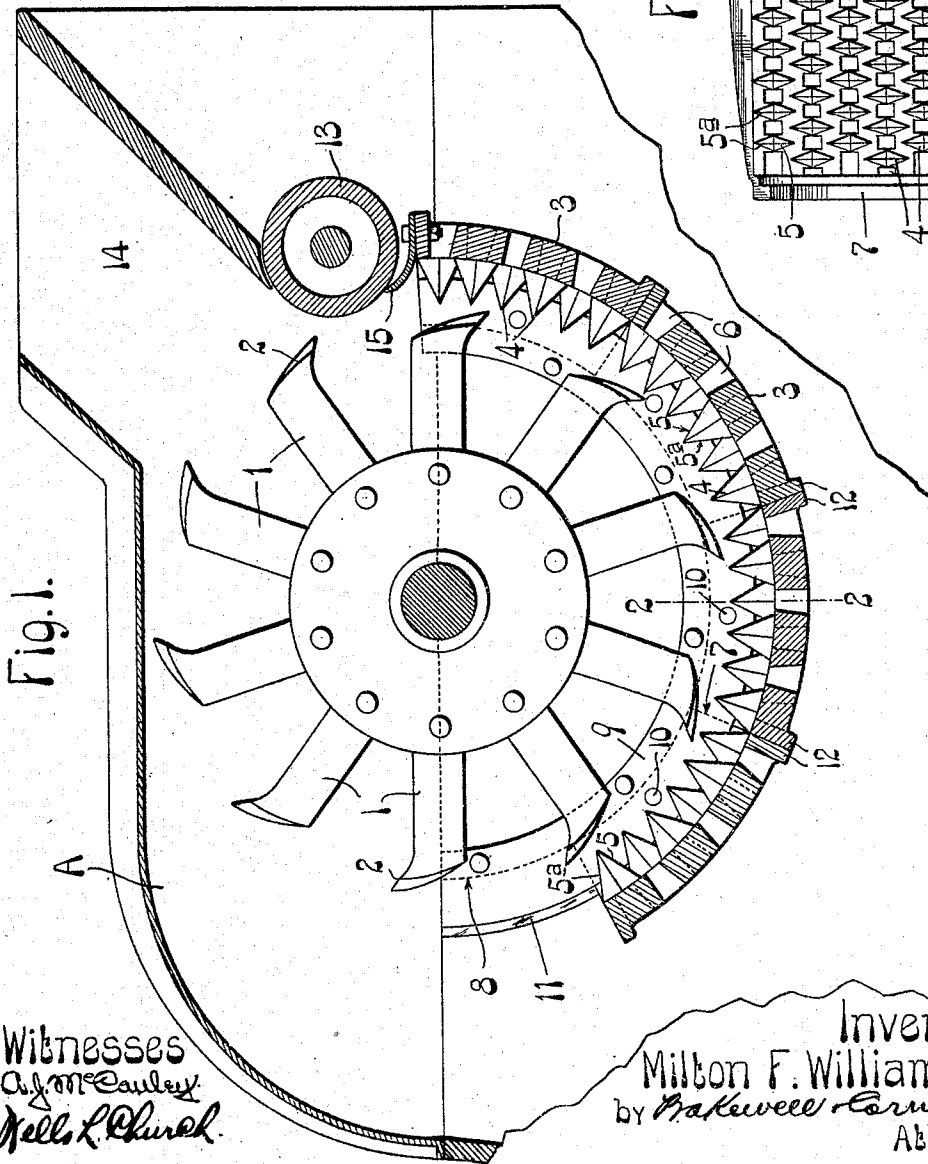


M. F. WILLIAMS.
CAGE FOR SHREDDING MACHINES.
APPLICATION FILED NOV. 4, 1908.

953,111.

Patented Mar. 29, 1910.



Witnesses
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UNITED STATES PATENT OFFICE.

MILTON F. WILLIAMS, OF ST. LOUIS, MISSOURI, ASSIGNOR TO WILLIAMS PATENT CRUSHER & PULVERIZER COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

CAGE FOR SHREDDING-MACHINES.

953,111.

Specification of Letters Patent.

Patented Mar. 29, 1910.

Application filed November 4, 1908. Serial No. 461,006.

To all whom it may concern:

Be it known that I, MILTON F. WILLIAMS, a citizen of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in Cages for Shredding-Machines, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical sectional view of a shredding machine provided with a cage constructed in accordance with my invention; Fig. 2 is a vertical sectional view taken on the line 2—2 of Fig. 1; and Fig. 3 is a top plan view of one section of the cage.

This invention relates to shredding machines, and particularly to the cages of said machines on which the material rests during the operation of shredding same.

My improved cage is particularly intended for use in machines employing pivoted rotating hammers and utilized for shredding textile fabrics, bark, roots, alfalfa, tarred rope, and analogous materials.

One object of my invention is to provide a cage or supporting surface for a shredding machine having a plurality of projections that tend to hold back the material and prevent the hammers of the machine from drawing the material too quickly over said supporting surface and thus fail to completely sever the material.

Another object of my invention is to provide a cage or supporting surface for a shredding machine having projections that are provided with sharp cutting edges that cooperate with the hammers of the machine to sever the material.

Another object is to provide a cage of the character described that can be built at a low cost. And still another object is to provide a cage composed of a number of reversible sections that carry projections, each of which is provided with a plurality of cutting edges.

I have herein illustrated my improved cage in operative position in a shredding machine provided with hammers of the type shown in my pending application Serial No. 433,483, filed May 18, 1908, but I do not wish it to be understood that said cage is limited in its use to a machine provided with

hammers of this type as it could be used with various types of shredding machines without departing from the spirit of my invention.

Referring to the drawings which illustrate the preferred form of my invention, A designates the casing of the machine inside of which the rotatable hammers 1 are arranged, said hammers being provided with forwardly projecting striking points 2 that have their side faces beveled off to produce cutting edges.

The cage or supporting surface on which the material rests during the shredding operation preferably consists of a number of sections, each of which has a curved portion 3 provided with a plurality of rows of projections 4 that are located outside of the path in which the striking points of the hammers travel. The projections 4 of each row are staggered relatively to each other and each of said projections is approximately pyramidal-shaped so as to form two oppositely inclined cutting edges 5 and 5^a, and two inclined side faces that diverge from each of said cutting edges. The projections 4 are not exactly pyramidal-shaped but they have a long longitudinal axis and a short transverse axis so that they are diamond-shaped in horizontal cross section. As only one-half of each projection performs any work when the machine is in operation; namely, that half which is presented toward the striking points of the hammers, the cage may said to be provided with a plurality of wedge-shaped projections that diminish gradually in dimensions from their bases toward their upper ends. The gradual reduction in horizontal cross sectional area of said projections produces a cutting edge that inclines in the direction in which the hammers of the machine travel and inclined side faces that diverge in opposite directions from said cutting edge so that too much resistance is not offered to the material as it is swept over the cage. The projections impede the movement of the material sufficiently to hold it on the cage long enough to enable the hammers to thoroughly cut and sever it, and the cutting edges of the projections also act to sever the material so that the material will be completely shredded when it leaves the cage. It will thus be seen that it is not necessary to make the projections approximately py-

ramidal-shaped but I prefer to form them in this manner so that the cage sections can be reversed when the projections become worn on one side.

5 Each section of the cage is formed as a single unit from cast metal, preferably cast steel, and the projections 4 are integrally connected to the curved portion 3, openings 6 being formed in the curved portion 3 be-
 10 tween the projections 4 of each row to permit some of the shredded material to drop down into the bottom of the casing A. At the opposite ends of the curved portion 3 of each section are approximately L-shaped
 15 flanges 7 that lie in curved slots 8 on the inside faces of the side walls of the casing A when the sections are in operative position, and said side walls are provided with removable plates or keepers 9 that partially
 20 close the slots 8 and lap over the upwardly projecting portions of the flanges 7, as shown in Fig. 2. The sections are arranged in position by inserting the flanges 7 in the open ends of the slots 8 and then sliding the
 25 sections longitudinally of said slots into the position shown in Fig. 1, and any suitable means can be employed for locking the sections in position so as to prevent longitudinal movement thereof, such, for example, as
 30 countersunk fastening devices 10 that pass through the flanges 7 and the side walls of the casing, as shown in Fig. 2, or fillers 11 that are inserted in the upper ends of the slots 8, as shown in Fig. 1. The longitudinal
 35 edges of the curved portion 3 of each section are provided with depending flanges 12 that butt against the depending flanges of the adjacent sections when said sections are arranged in operative position.
 40 A feed roll or rotatable breaker element 13 is arranged at the lower end of the feed opening 14 of the machine, and the cage section which is located underneath said feed roll is provided at its upper edge with a
 45 yielding plate 15 that bears upon the periphery of said roll so as to prevent the material from escaping through the slot formed between the upper edge of said section and the roll 13.
 50 The projections 4 of the cage tend to hold back the material and thus prevent the hammers from sweeping the material too quickly over the cage, so that a complete and thorough shredding of the material is
 55 insured, and the inclined cutting edges 5 on the projections, which are presented toward the hammers, also cooperate with the hammers to sever the material. When said inclined cutting edges become dull the
 60 cage sections can be reversed to bring the cutting edges 5^a of the projections into operative position so that the cage can be used for a long period. The sections can be produced at a low cost as each section is cast
 65 as a single unit with the projections 4 and

flanges 7 and 12 formed integral with the curved portion 3, the openings 6 in said curved portion also being formed during the operation of casting the section.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a shredding machine employing a plurality of pivoted rotating hammers, a rigidly held curved cage arranged outside
 75 the path of travel of the outer ends of said hammers, rows of staggered upwardly extending projections on the face of the cage, each of which projections is provided with a pair of oppositely disposed, sharpened
 80 edges and there being openings formed through the cage between the projections.

2. In a shredding machine employing a plurality of pivoted rotating hammers, a cage comprising a series of sections which
 85 are curved in cross section and rigidly held in position just outside the path of travel of the outer ends of the hammers, and a series of rows of staggered projections on each section, each of which projections is provided
 90 with a pair of oppositely disposed inclined sharpened edges.

3. In a shredding machine employing a plurality of pivoted rotating hammers, a cage comprising a series of sections which
 95 are curved in cross section and rigidly held in position just outside the path of travel of the outer ends of the hammers, a series of rows of staggered projections on each section, each of which projections is provided
 100 with a pair of oppositely disposed inclined sharpened edges, and there being openings formed through the body of each section between the projections thereof.

4. In a shredding machine employing pivoted rotating hammers having sharpened
 105 cutting edges on their outer ends, a rigidly held curved cage arranged outside the path of travel of the outer ends of said hammers, rows of projections on the face of said cage
 110 and each projection having an inclined sharpened cutting edge which opposes the sharpened edges of the hammers.

5. A cage for shredding machines, comprising a number of reversible sections, each
 115 of which consists of a curved cast metal member provided at its ends with integral supporting flanges and having a number of integral upwardly extending projections that have a pair of oppositely disposed in-
 120 clined cutting edges; substantially as described.

6. A cage for shredding machines, composed of a number of cast metal sections provided on their longitudinal edges with
 125 depending flanges and on their ends with approximately L-shaped flanges that are adapted to be engaged by the means that support the cage in position, each of said sections having a plurality of openings, and
 130

a plurality of integral upwardly extending projections arranged between said openings, each of which projections is provided with a pair of oppositely disposed, inclined cutting edges; substantially as described.

7. In a shredding machine, provided with pivoted rotatable hammers having cutting ends, a curved cage or shredding surface comprising a number of sections arranged outside of the path of said hammers and provided with upwardly extending projections of approximately pyramidal shape and each projection having a pair of oppositely disposed, inclined cutting edges; substantially as described.

8. In a shredding machine, a casing having curved grooves formed in the inner faces of the side walls thereof, a cage consisting of a number of cast metal sections provided at their ends with approximately L-shaped flanges that enter said grooves, and also provided with rows of upwardly extending tapered projections of approximately diamond-shape in cross section, each of which projections is provided with a pair of oppositely disposed, inclined cutting edges and rotatable hammers arranged inside of said casing and provided with cutting edges for severing the material that lies on said cage; substantially as described.

9. In a shredding machine having a casing that is provided with a feed opening, a roller arranged below said feed opening, a curved cage having one of its ends terminat-

ing adjacent said roller and provided with rows of upwardly extending projections, and a yielding plate connected to the upper end of said cage and bearing upon the periphery of said roller; substantially as described.

10. In a shredding machine, employing a plurality of pivoted rotating hammers, having cutting edges, a curved cage arranged outside the path of travel of said hammers, and provided with openings, rows of staggered upwardly extending projections on the faces of said cage, each of said projections having a pair of oppositely disposed inclined cutting edges, one of which edges inclines in the direction in which the hammers of the machine rotate, and said projections having inclined faces that diverge in opposite directions from said cutting edges.

11. In a shredding machine employing pivoted rotating hammers, the outer ends of which are pointed and provided with cutting edges, a cage provided with pointed projections, which projections are each provided with a pair of oppositely disposed, inclined cutting edges.

In testimony whereof I hereunto affix my signature in the presence of two witnesses, this thirty first day of October 1908.

MILTON F. WILLIAMS.

Witnesses:

WELLS L. CHURCH,
GEORGE BAKEWELL.