ABSTRACT OF THE DISCLOSURE

A knife device having a body member including a chamber with a freely movable ball member actuated by an air supply for vibrating a blade rigidly secured to the body member to provide blade cutting action. A plurality of chambers may be provided in the body member and means may be provided for causing the ball members to move in dissimilar patterns to maximize the blade cutting action. The blade may be detachably connected to the body member by a movable anchor element biased into engagement with the blade by a spring and air pressure. The vibration chamber in the body of the blade is sealed to prevent air from contaminating the area in proximity to the blade.

Heretofore, the common packing house procedure involved using a cleaver for splitting the animal carcass. This operation may involve taking a short bladed knife and beating it with a rubber mallet. These manually operated tools require a great deal of effort on the part of the operator and become very fatiguing. Also, a higher degree of skill is required for the manually operated tool than with the power tool of this invention.

Accordingly, it is one of the principal objects of this invention to provide an impact blade knife which can be readily operated by a relatively unskilled individual with a minimum of effort in accurately splitting animal carcasses.

Another object of this invention is to provide an impact blade knife tool having an easily removable knife blade.

A still further object of this invention is to provide an impact blade knife having a removable blade which is positively anchored in its position of use.

A still further object of this invention is to provide an impact blade knife having a blade anchoring means including an air cylinder operatively connected to a latch engaging the knife blade.

A still further object of this invention is to provide an impact blade knife having a blade with a forward extension which is particularly well suited for opening the briskets of animals.

A still further object of this invention is to provide an impact blade knife having a vibration inducing means including at least one chamber or cage having an air actuated ball means therein.

It is a related object of this invention to provide an impact blade knife having an air vibration inducing means connected to a pair of cages having balls therein wherein in operation the balls move in opposite directions under the air pressure.

A still further related object of this invention is to provide an impact blade knife having a vibration inducing means mounted integrally in the body of the impact blade knife.

A still further object of this invention is to provide an impact blade knife having an air actuated vibration inducing means including a pair of vibrators arranged to operate in opposite directions under the air pressure.

A further object of this invention is to provide an impact blade knife which is simple in design, economical to manufacture and refined in appearance.

These and other objects will be apparent to those skilled in the art.

This invention consists in the construction, arrangement, and combination of the various parts of the device, whereby the objects contemplated are attained as hereinafter more fully set forth, specifically pointed out in the claims, and illustrated in the accompanying drawings in which:

FIG. 1 is a perspective view of the impact blade knife of this invention;
FIG. 2 is a top plan view;
FIG. 3 is a cross-sectional elevational view taken along line 3—3;
FIG. 4 is an end elevation view taken along line 4—4 in FIG. 4;
FIG. 5 is a fragmentary side elevation view showing an alternate blade;
FIG. 6 is a fragmentary cross-sectional view enlarged to show the details of the blade anchoring means; and
FIG. 7 is a cross-sectional view taken along line 7—7 in FIG. 6.

The impact blade knife of this invention is generally referred to in FIG. 1 by the reference numeral 10 and includes an elongated gun shaped body 12 having a handle 14 and a barrel portion 16. A blade 18 is detachably mounted to the bottom side of the barrel portion 16. The body 12 is integrally formed but has a detachable cover plate 20 secured to the sides of the barrel portions 16.

A pair of air hoses 22 and 24 connect to the base of the handle 14 and communicate with passageways 26 and 28 extending lengthwise of the body 12 for communication with a pair of vibration inducing chambers or cages 30 and 32. The hose 22 serves as an air inlet hose while the hose 24 functions as an outlet hose. A ball 34 is provided in each of the chambers 30 and 32 and upon introduction of the air under pressure through the hose 22 and the passageway 26 the balls are caused to revolve in opposite directions as indicated by the arrows in the chambers 30 and 32. The air then escapes to the outlet passageway 28 and to the outlet hose 24.

A transversely extending valve element 36 is provided in the body 12 and is adapted to rotate to open and close the air inlet passageway 26. A finger actuating lever 38 extends downwardly from the generally cylindrical in cross-section valve element 36 and is biased by spring 40 to a position closing the passageway 26 as seen in FIG. 6. Thus, the impact blade knife will be caused to vibrate upon opening the passageway 26 to the passage of air to the vibration chambers 30 and 32.

The cutting blade 18 is received in an elongated recess formed in the lower edge of the barrel portion 16. The barrel portion 16 has an integral anchor portion 44 which extends downwardly and longitudinally inwardly toward the handle 14. The blade 18 is formed with a mating recess 46 to receive the anchor portion 44. At the inner end of the blade 18 a similar recess 48 is formed and receives a movable anchor element 50. The anchor element 50 is provided with a finger actuating downwardly extending portion 52. As seen in FIG. 6, a coil spring 54 is mounted in the barrel to bias the movable anchor element 50 into engagement with the blade recess 48. A piston rod 56 extends longitudinally through the spring 54 and into a chamber 58 which is in communication through a passageway 60 with the air inlet passageway 26. A piston 62 is mounted on the end of the piston rod 54 in the chamber 58 whereby when air pressure is applied the opposite end of the piston rod received in a recess 64 biases the movable anchor element 50 into mating engagement with the recess 48 formed in the blade 18.

A second handle 66 is provided on the barrel of body
portion 16 and extends transversely outwardly from one side. The operator would then place one hand on the handle 14 and the other hand on the handle 66. A finger of the hand on the handle 14 would be in a position to operate the valve trigger element 38.

In FIG. 5 a modified blade 18A is shown having a forwardly extending blade portion 68 which is particularly well suited for opening bristles of animals.

Thus it is seen that the use of the hulls 34 in the cages 30 and 32 under air pressure as the vibration inducer eliminates the problem of external moving parts which cause contamination and clean-up problems in packing plants.

As it is necessary from time to time to replace the blades in the impact blade knife, it is apparent that the latching arrangement disclosed and described will minimize the time required for removal and replacement.

Some changes may be made in the construction and arrangement of my impact blade knife without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims, any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope.

I claim:

1. An impact blade knife, comprising:
   an elongated body member having at least one chamber intermediate its ends,
   a cutting blade rigidly secured to said body member, a ball member movable in said chamber, and
   an air supply connected to said chamber for agitating said ball member in said chamber and vibrating said body member whereby said cutting blade is vibrated for cutting action.

2. The structure of claim 1 wherein said chamber is sealed closed and an outlet conduit is connected to said chamber to exhaust air therefrom remotely of the proximity of said cutting blade, whereby said cutting blade is protected from air from said air supply.

3. The structure of claim 1 wherein said body member includes a second chamber, and a ball is disposed in said second chamber, said air supply being in communication with said second chamber, and means for causing said balls to move in dissimilar patterns.

4. The structure of claim 1 wherein said body member is gun shaped and includes a handle and a barrel portion and said blade is positioned on the bottom side of said barrel portion adjacent said handle portion, said blade is detachably secured to said body member, said body member having an elongated recess formed longitudinally of said barrel to receive said blade, a fixed anchor element extending downwardly and longitudinally inwardly of said barrel portion, said blade having a notch at one end for matingly receiving said fixed anchor element, a movable anchor element positioned at the opposite end of said barrel and extending downwardly and longitudinally towards said fixed anchor element, said blade having a second notch at the opposite end of said barrel portion, and means for presenting said movable anchor element in engagement with said second notch in said blade.

5. The structure of claim 4 and an air supply connected to an air chamber, a piston in said chamber operatively connected to said movable anchor element for maintaining said movable element in engagement with said second notch in said blade.

6. The structure of claim 5 and a spring means bears against said movable anchor element for maintaining said movable element in engagement with said second notch in said blade.

7. An impact blade knife, comprising, a gun shaped body member, a cutting blade mounted on said body member, vibration inducing means on said body member, an air supply connected to said vibration inducing means, said vibration inducing means is located above and intermediate the ends of said blade and in said barrel portion of said body and means rigidly securing said blade to said body member and said vibration inducing means on said body member operative to vibrate said blade only by vibrations being transmitted through said body member to said blade rigidly connected thereto.

8. An impact blade knife, comprising, a gun shaped body member, a cutting blade mounted on said body member, vibration inducing means on said body member, said gun shaped body member including a handle and a barrel portion and said blade being positioned on the bottom side of said barrel portion adjacent said handle portion, said blade being detachably secured to said body member, said body member having an elongated recess formed longitudinally of said barrel to receive said blade, a fixed anchor element extending downwardly and longitudinally inwardly of said barrel portion, said blade having a notch at one end for matingly receiving said fixed anchor element, a movable anchor element positioned at the opposite end of said barrel and extending downwardly and longitudinally towards said fixed anchor element, said blade having a second notch at the opposite end of said first notch for matingly receiving said movable anchor element, and an air supply connected to an air chamber, a piston in said chamber operatively connected to said movable anchor element for maintaining said movable element in engagement with said second notch in said blade, and an air supply connected to said vibration inducing means, and a valve means in said body member for opening and closing said air supply to said vibration inducing means, said air supply connection to said air chamber being direct to continuously maintain pressure on said second anchor element independently of said vibration inducing means.

9. An impact blade knife, comprising, a gun shaped body member, a cutting blade mounted on said body member, vibration inducing means on said body member, an air supply connected to said vibration inducing means, said vibration inducing means includes a pair of annular chambers, each having a ball means freely movable therein around the periphery of said chambers, said air supply being connected to said chambers to move said balls in opposite directions, and said chambers being located in relatively close relationship to each other on the longitudinal axis of said barrel portion.

10. The structure of claim 9 and said blade includes a portion which extends longitudinally of said barrel portion and outwardly and below the outer end of said barrel portion.

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