March 13, 1934. J. J. GAMBEE 1,951,190

FINGER AND HAND GUARD

Filed July 29, 1932

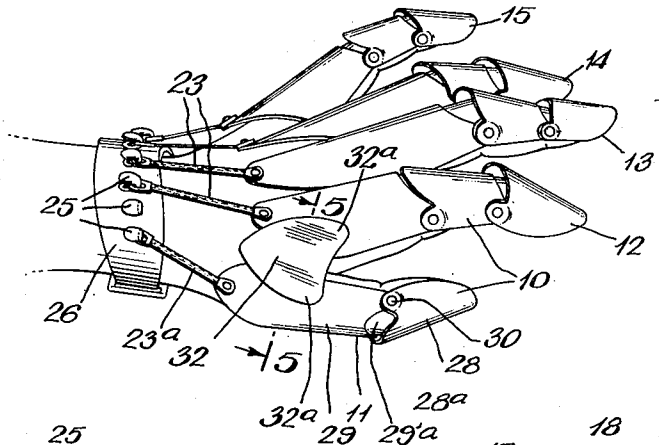


Fig. 1.

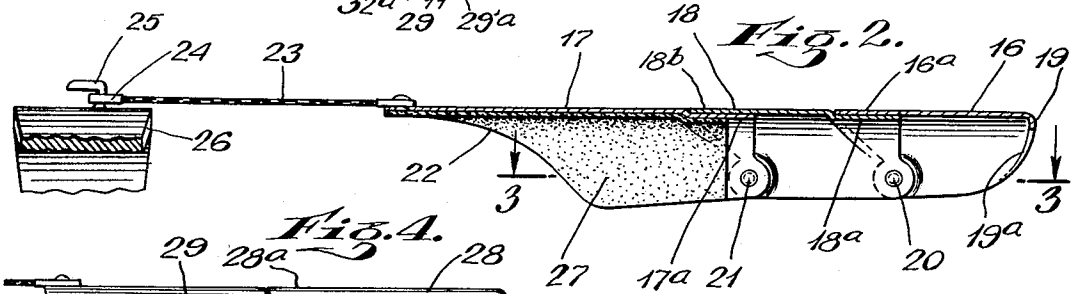


Fig. 2.

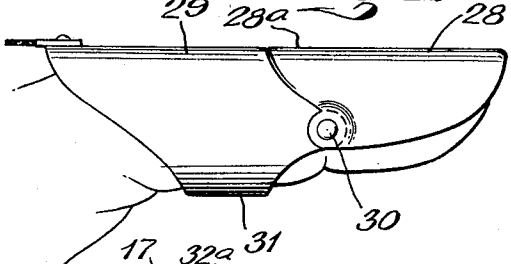


Fig. 4.

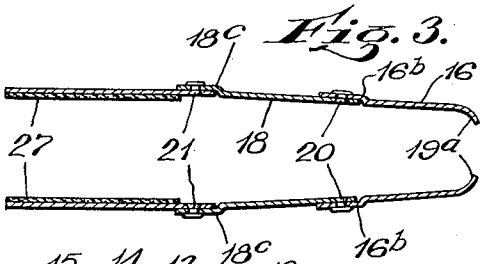


Fig. 3.

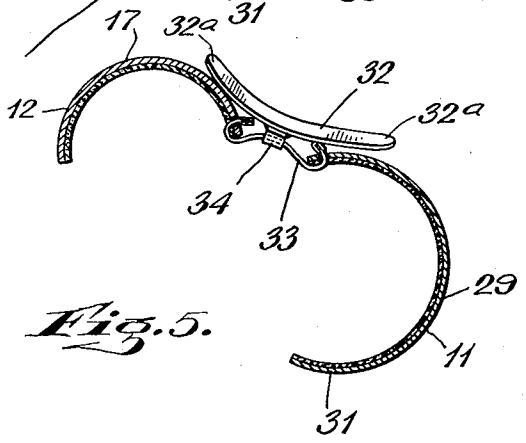


Fig. 5.

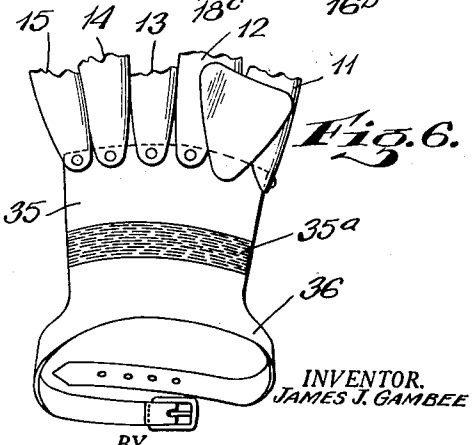


Fig. 6.

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FINGER AND HAND GUARD

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12 Claims. (Cl. 2—21)

This invention relates to guard devices for use upon the fingers and hand of an operator to guard the fingers and the hand against injury when working on machinery of various kinds and classes, such for example as on sewing machines, cloth cutting machines, jig-saws, planers and the like; and the object of the invention is to provide a guard device made up of a plurality of finger units including two or more jointed sections disposed in alinement with the joints of the fingers to permit the free flexure of the guard in the operation of bending the fingers, thus permitting free use of the hand in handling work pieces of various kinds and classes; a further object being to provide means for supporting one or more of the finger guards upon the finger or fingers of the hand, and preferably a means having elastic or resilient properties to tensionally support the guard or guards upon the fingers of the hand and yet permit the free flexure of the fingers as well as the hand at the wrist, without inconvenience to the operator or user; a still further object being to provide means for shielding or guarding the web of the hand between the thumb and index finger; a further object being to provide a guard wherein one or more of the sections is provided with a lining of cushioning material; a still further object being to provide a guard of the class described wherein the guard finger sections are arranged to cover the top and sides of the fingers to leave the lower surfaces of the fingers and hand exposed for engagement with the workpiece in the use of the device; and with these and other objects in view, the invention consists in a device of the class and for the purpose specified, which is simple in construction, efficient in use, and which is constructed as hereinafter described and claimed.

The invention is fully disclosed in the following specification, of which the accompanying drawing forms a part, in which the separate parts of my improvement are designated by suitable reference characters in each of the views, and in which:—

Fig. 1 is a perspective view of a hand showing a complete series of finger and hand guards mounted thereon and indicating the method of their use.

Fig. 2 is a longitudinal sectional view through one of the guards shown in Fig. 1 with the parts in closed position.

Fig. 3 is a section on the line 3—3 of Fig. 2.

Fig. 4 is a side view of the thumb guard which I employ.

Fig. 5 is a partial section on the line 5—5 of Fig. 1; and,

Fig. 6 is a plan view of a guard similar to that shown in Fig. 1 and illustrating a modified method of attaching the same to the hand or wrist of the wearer.

It has long been experienced that many casualties have occurred to workers on machinery and apparatus of various kinds and classes, and particularly injury to the hand or fingers of the hand of operators working on sewing machines, fabric and other cutting machines, jig-saws, planers and like apparatus in the process of feeding a workpiece or workpieces into the machine. The purpose of my invention is to provide a shield or guard mounted upon the fingers so as to protect them from injury by coming in contact with the needle of a sewing machine, or the working tool or other means of the class specified, and yet to expose the hand surfaces of the fingers and the hand to permit the free use of the hand and to provide the sense of touch in handling and feeding workpieces.

In the accompanying drawing I have shown for the purpose of illustrating one use of my invention a guard consisting of a number of finger units 10, each unit being substantially of the same construction, but being of a contour suitable for fitting the five fingers of the hand, and consisting of a thumb unit 11 and four finger units 12, 13, 14 and 15. The units of the fingers 12 to 15 inclusive differ from the thumb unit 11 in that the former have two joints and the latter has a single joint.

The brief description of one of the finger units 12 to 15 inclusive will apply to all. These units are made up in three parts, an outer tip part 16, an inner finger and hand part 17, and an intermediate part 18. The part 16 terminates at its end in an inturned flange 19 which engages the nail of the finger to prevent displacement of the guard, each part 16, 17 and 18 being semi-circular, U-shaped or channel-shaped in cross sectional form, with the channel opening downwardly to expose the lower surfaces of the fingers from the bottom of the guards.

The inner end 16*a* of the outer part 16 overlaps a depressed forward part 18*a* of the part 18, and the side portions of said parts are pivoted or jointed together as indicated at 20. The joined end of the part 18 fits in an outwardly pressed portion 16*b* of the part 16 to provide flush inner surfaces at the joints or pivots of said parts. The inner end portion 18*b* of the part 18 overlaps a depressed forward part 17*a* of the part 17,

and the parts 17 and 18 are pivoted or jointed together as seen at 21, the same as the joint 20. The part 18 is pressed outwardly at the joint as seen at 18c to provide the flush inner surface. This construction is desirable for the reason that the knuckle of the average finger is somewhat enlarged, and it is desirable to provide a flush inner surface to prevent irritation of the joints, it being understood that the finger sections are fashioned to fit snugly around the upper end and sides of the fingers.

The inner part 17 of the finger section has its side walls cut away as seen at 22, note Fig. 2 of the drawing, so as to conform with the crevices between the fingers of the hand. Attached to the inner end of the part 17 as seen in Figs. 1 to 4 inclusive, is an elastic or resilient strap or band 23 having at its end a loop 24 adapted to detachably engage one of a number of hooks 25 supported on the outer surface of a wrist encircling strap 26, which is secured about the wrist of the wearer by a buckle or any other means as will be apparent.

In some instances, it may be desirable to line the parts of the finger guard with a facing of suitable cushioning material. In Figs. 2 and 3 of the drawing, I have shown the part 17 with such a lining 27. It will be understood, however, that this lining may or may not be employed.

The inturned flange 19 of the outer part or tip 16 of the finger guard section extends to the side walls of said part as indicated at 19a, note Fig. 3 of the drawing, so as to partially cover the outer tip end of the finger and to insure against any exposure of the tip of the finger as well as to aid in holding the device upon the finger.

The thumb section 11 differs from the finger sections 12 to 15 inclusive, in that an outer tip part 28 and an inner part 29 only are employed. The tip part 28 is similar to the tip parts 16, the inner ends 28a overlapping depressed outer ends 29a of the part 29, and their side walls are pivoted or jointed together as seen at 30. The part 29 is of the general contour of the part 17, except that the part 29 includes a downwardly extending curved portion 31 which prevents lateral movement of the thumb section on the thumb of the hand in the operation of spreading the thumb and index fingers, especially when a web guard 32 is employed. An elastic strap or band 23a extends from the part 29 of the thumb section and is coupled with one of the hooks 25, the same as the bands 23.

The web guard 32 is in the form of a triangular or heart shaped shield, having winged portions 32a overlapping the part 29 of the thumb section and the part 17 of the finger section 12 as clearly seen in Figs. 1 and 5. This guard is supported upon an elastic or yielding strap 33, the ends of which are coupled with the parts 17 and 29, the guard 32 having a loop 34 mounted on the strap 33, permitting free longitudinal movement of the guard with respect to said strap as well as permitting relative movement of the parts 17 and 29 of the finger sections with respect to each other.

In Fig. 6 of the drawing, I have shown a slight modification wherein the finger sections 11, 12, 13, 14 and 15 are coupled with a band 35 which covers the top of the hand and includes at its inner end a wrist encircling strap 36 for supporting the band 35 upon the hand and wrist of the wearer and for holding the finger sections upon the fingers of the hand, the band including an elastic insert 35a to provide a yielding movement of the finger sections with respect to the wrist, permitting free bending of the fingers of the hand and opening and closing of the fist.

It will be apparent upon a consideration of Fig. 1 of the drawing that in flexing or bending the fingers of the hand with the guard sections mounted thereon, the depressed inner parts 18a, 17a and 29a will cover and guard the joints of the fingers as the parts 16, 18 and 28 are flexed or moved on their respective pivots or joints, thus affording a guard and protector for the fingers of the hand, regardless of the position of the fingers or joints of the fingers.

By virtue of the curved contour of the separate parts of the guard sections, which as will be understood will be made of a strong and durable metal, a tool such as a needle, knife or the like, will be deflected from the finger, by the guard, thus avoiding injury. In cases where the fingers may be subjected to squeezing pressure, the guard will take up the major portion of the blow or pressure and materially reduce the injury to the fingers.

It will also be understood that in many instances only one or two of the guard sections need be employed. For example, in needle work or for operators of sewing machines, in most cases a guard for the thumb and index finger only will be necessary and the finger guard sections 13, 14 and 15 may be eliminated. In other cases, the finger guard sections 12, 13 and 14 only need be employed.

It will also be understood that while I have shown certain details of construction for carrying my invention into effect, and have illustrated different methods of supporting the guard sections upon the fingers and hand, my invention is not limited in these respects, and various other changes in and modifications of the construction herein shown and described may be made within the scope of the appended claims without departing from the spirit of my invention or sacrificing its advantages.

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

1. A finger guard of the class described comprising a plurality of finger sections, each section being composed of separate, hingedly coupled parts to provide relative movement between said parts, the hinge connections of said parts being disposed at the joints of the fingers, said parts being of channeled cross sectional form of cover and protect the top and side portions of the fingers and to expose the lower parts of the fingers to provide the sense of touch, means for yieldably supporting said finger guard sections upon the fingers of the hand, the outer or tip part of each finger section including an inturned flange overlying the finger tip and preventing inward movement of the guard section on the finger of the hand, said guard sections comprising a thumb section and an index finger section, and a shield disposed between and overlapping the inner ends of said sections to guard the web of the hand between said thumb and index finger.

2. A finger guard of the class described comprising a plurality of finger sections, each section being composed of separate, hingedly coupled parts to provide relative movement between said parts, the hinge connections of said parts being disposed at the joints of the fingers, said parts being of channeled cross sectional form to cover and protect the top and side portions of the fin-

gers and to expose the lower parts of the fingers to provide the sense of touch, means for yieldably supporting said finger guard sections upon the fingers of the hand, the outer or tip part of each finger section including an inturned flange overlying the finger tip and preventing inward movement of the guard section on the finger of the hand, said guard sections comprising a thumb section and an index finger section, a shield disposed between and overlapping the inner ends of said sections to guard the web of the hand between said thumb and index finger, and means for yieldably supporting said web guard to compensate for relative movement of said fingers.

3. A finger guard of the class described comprising a plurality of finger sections, each section being composed of separate, hingedly coupled parts to provide relative movement between said parts, the hinge connections of said parts being disposed at the joints of the fingers, said parts being of channeled cross sectional form to cover and protect the top and side portions of the fingers and to expose the lower parts of the fingers to provide the sense of touch, means for yieldably supporting said finger guard sections upon the fingers of the hand, the outer or tip part of each finger section including an inturned flange overlying the finger tip and preventing inward movement of the guard section on the finger of the hand, said guard sections comprising a thumb section and an index finger section, a shield disposed between and overlapping the inner ends of said sections to guard the web of the hand between said thumb and index finger, means for yieldably supporting said web guard to compensate for relative movement of said fingers, said first named means including a wrist encircling strap, and one part of said finger guard sections including a lining of cushioning material.

4. A finger guard of the class described comprising a thumb part and an index finger part, each part being composed of joint sections coupled together to provide relative movement therebetween to compensate for the bending of the joints of the fingers, and a shield disposed between and overlapping the inner ends of the thumb and finger parts to guard the web of the hand between the thumb and index finger.

5. A finger guard of the class described comprising a thumb part and an index finger part, each part being composed of joint sections coupled together to provide relative movement therebetween to compensate for the bending of the joints of the fingers, a shield disposed between and overlapping the inner ends of the thumb and finger parts to guard the web of the hand between the thumb and index finger, and means for coupling said shield to said thumb and finger parts.

6. A finger guard of the class described comprising a plurality of independent finger parts arranged on the fingers of the hand, each part consisting of a plurality of joint sections covering the top and sides of the fingers and pivoted together at the joints of the fingers and the outer joint parts of said fingers including an inwardly turned flange engaging the nails of ths fingers to prevent inward movement of the guard sections thereon and so as to expose the tip and under sides of the fingers to provide the sense of touch.

7. A finger guard of the class described comprising a plurality of independent finger parts arranged on the fingers of the hand, each part consisting of a plurality of joint sections covering the top and sides of the fingers and pivoted together at the joints of the fingers and the outer joint parts of said fingers including an inwardly turned flange engaging the nails of the fingers to prevent inward movement of the guard sections thereon and so as to expose the tip and under sides of the fingers to provide the sense of touch, and a shield disposed between the inner ends of the thumb and index finger guard parts to guard the web of the hand between the thumb and index finger.

8. A finger guard of the class described comprising a plurality of independent finger parts arranged on the fingers of the hand, each part consisting of a plurality of joint sections covering the top and sides of the fingers and pivoted together at the joints of the fingers and the outer joint parts of said fingers including an inwardly turned flange engaging the nails of the fingers to prevent inward movement of the guard sections thereon and so as to expose the tip and under sides of the fingers to provide the sense of touch, a shield disposed between the inner ends of the thumb and index finger guard parts to guard the web of the hand between the thumb and index finger, and the pivotal coupling between the separate joint sections of said parts being such as to arrange the inner surfaces of adjacent sections in common alinement.

9. A finger guard of the class described comprising a plurality of independent finger parts arranged on the fingers of the hand, each part consisting of a plurality of joint sections covering the top and sides of the fingers and pivoted together at the joints of the fingers and the outer joint parts of said fingers including an inwardly turned flange engaging the nails of the fingers to prevent inward movement of the guard sections thereon and so as to expose the tip and under sides of the fingers to provide the sense of touch, a shield disposed between the inner ends of the thumb and index finger guard parts to guard the web of the hand between the thumb and index finger, a wrist encircling strap having spaced coupling elements, and each of said parts including a resilient band detachably coupled with the elements of said strap for yieldably supporting the separate parts on the fingers of the hand.

10. A finger guard of the class described comprising an elongated body composed of separate finger joint parts, each part consisting of top and side walls covering the top and sides only of the finger or the separate joint parts thereof, the outer joint part being open to expose the tip end of the finger and the top wall extended to form a finger nail engaging flange to retain the guard against inward movement on the finger, means including overlapped portions on adjacent edges of said separate parts for permitting relative movement of the parts one with respect to the other, the inside surface of the side walls of said parts being in substantial alinement and said overlapped portions nesting one within the other so as to arrange the inner surfaces of the side walls of adjacent parts in common alinement.

11. A finger guard of the class described comprising an elongated body composed of separate finger joint parts, each part consisting of top and side walls covering the top and sides only of the finger or the separate joint parts thereof, the outer joint part being open to expose the tip end of the finger and the top wall extended to form a finger nail engaging flange to retain

the guard against inward movement on the finger, means including overlapped portions on adjacent edges of said separate parts for permitting relative movement of the parts one with respect to the other, the inside surface of the side walls of said parts being in substantial alinement and said overlapped portions nesting one within the other so as to arrange the inner surfaces of the side walls of adjacent parts in common alinement, a wrist encircling strap, and resilient means for coupling the finger guard with the strap to prevent outward movement of the guard on the finger.

12. A finger guard of the class described comprising an elongated body composed of separate finger joint parts, each part consisting of top and side walls covering the top and sides only of the finger or the separate joint parts thereof, the outer joint part being open to expose the tip end of the finger and the top wall extended to form a finger nail engaging flange to retain the guard against inward movement on the finger, means including overlapped portions on adjacent edges of said separate parts for permitting relative movement of the parts one with respect to the other, the lower surface of the side walls of said parts being in substantial alinement and said overlapped portions nesting one within the other so as to arrange the inner surfaces of the side walls of adjacent parts in common alinement, and the upper wall portion of the inner joint parts being offset inwardly at the end next the adjacent outer part to receive an overlapped portion on the inner end of said adjacent part.

JAMES J. GAMBEE.