Feb. 18, 1936. H. C. MOULTON 2,031,545

COMBINED SEAMING AND PINKING MACHINE

Filed Sept. 17, 1934 4 Sheets-Sheet 1

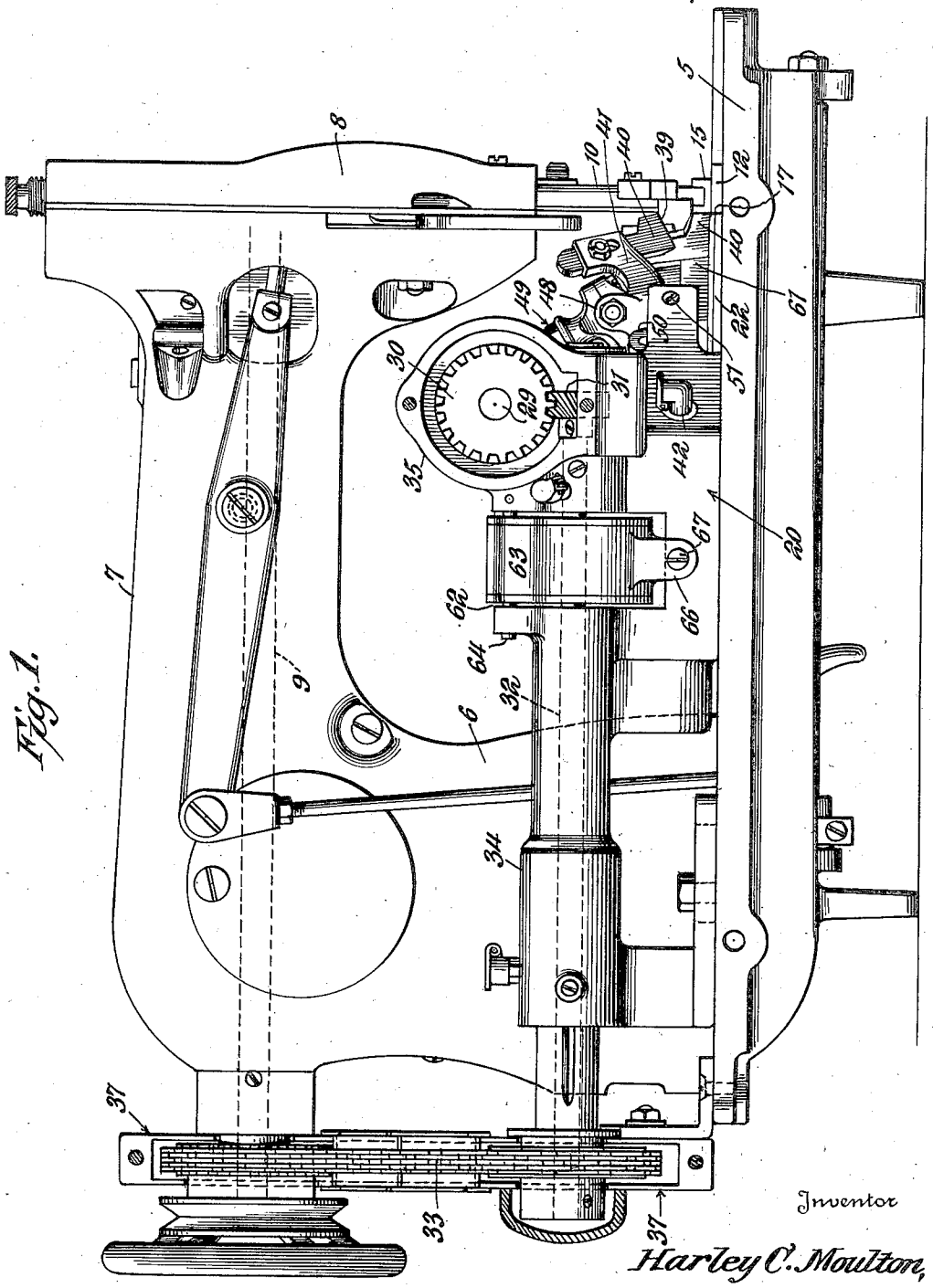


Fig. 1.

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Fig. 5.

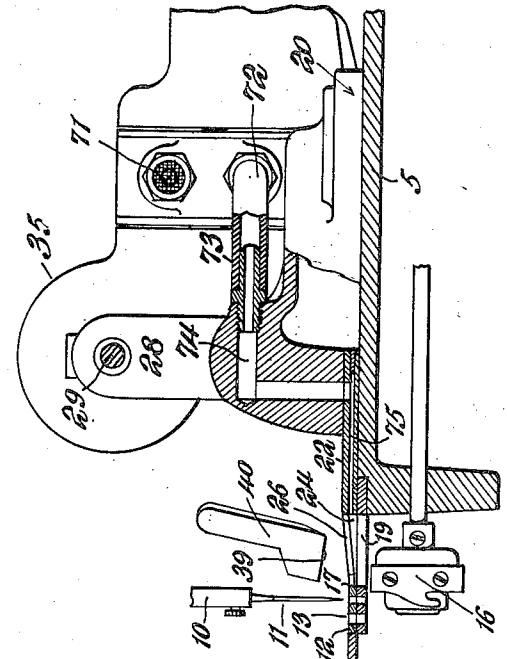


Fig. 7.

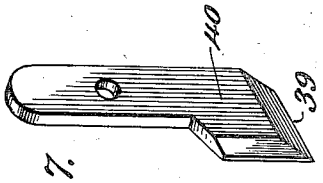
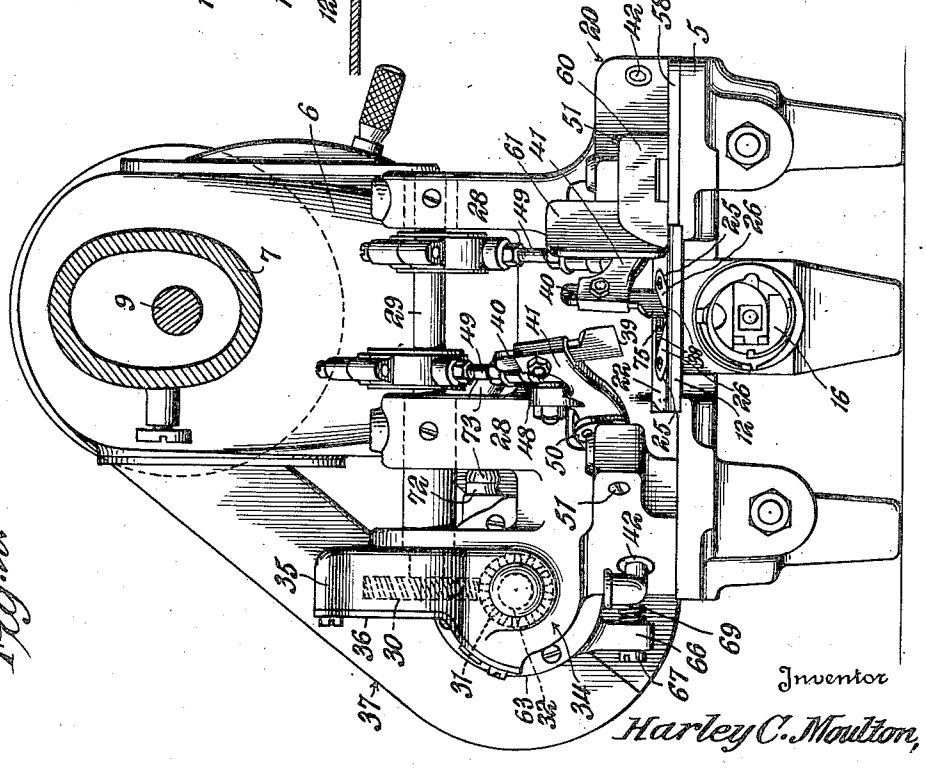


Fig. 2.



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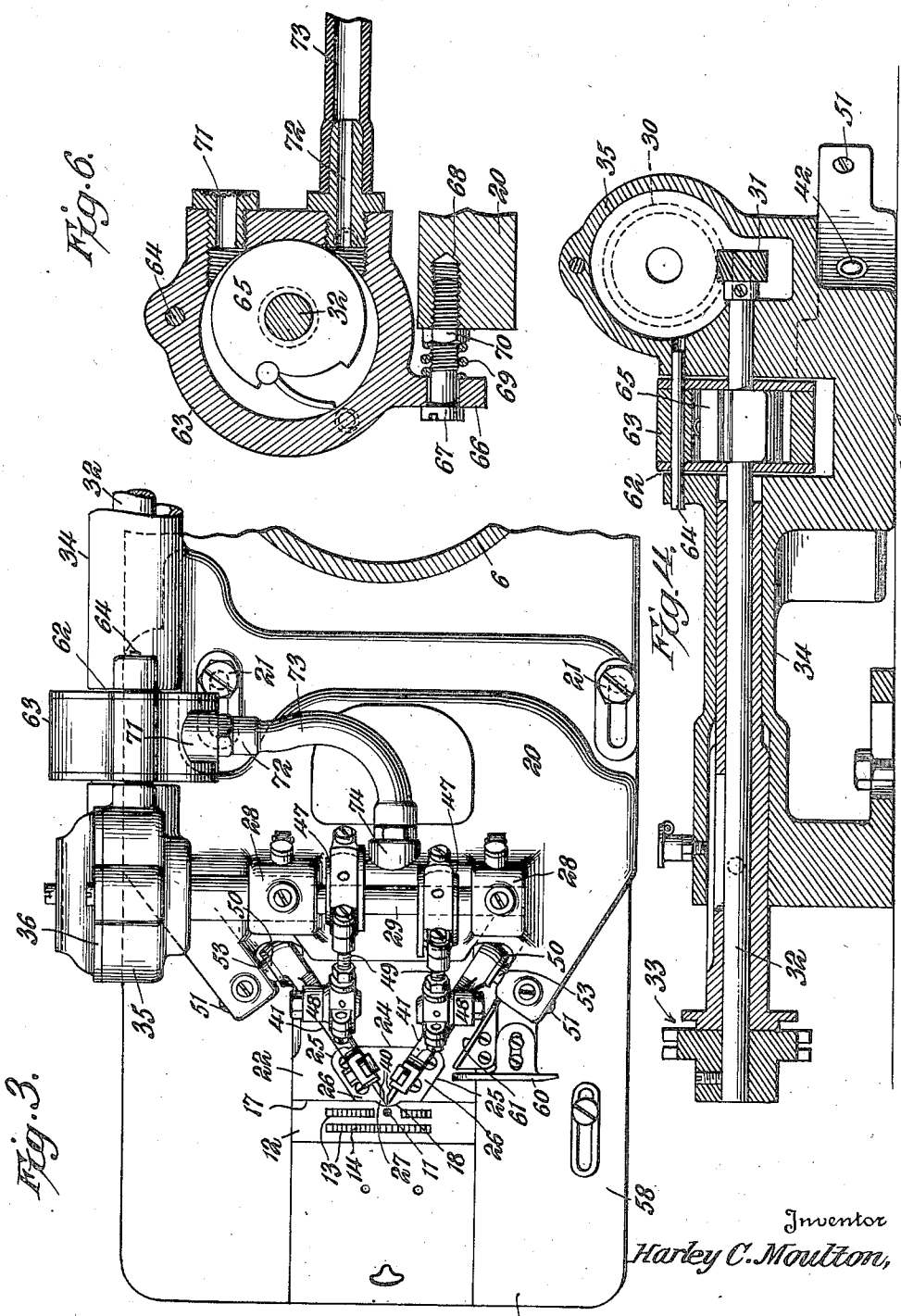


Fig. 3.

Fig. 6.

Fig. 4.

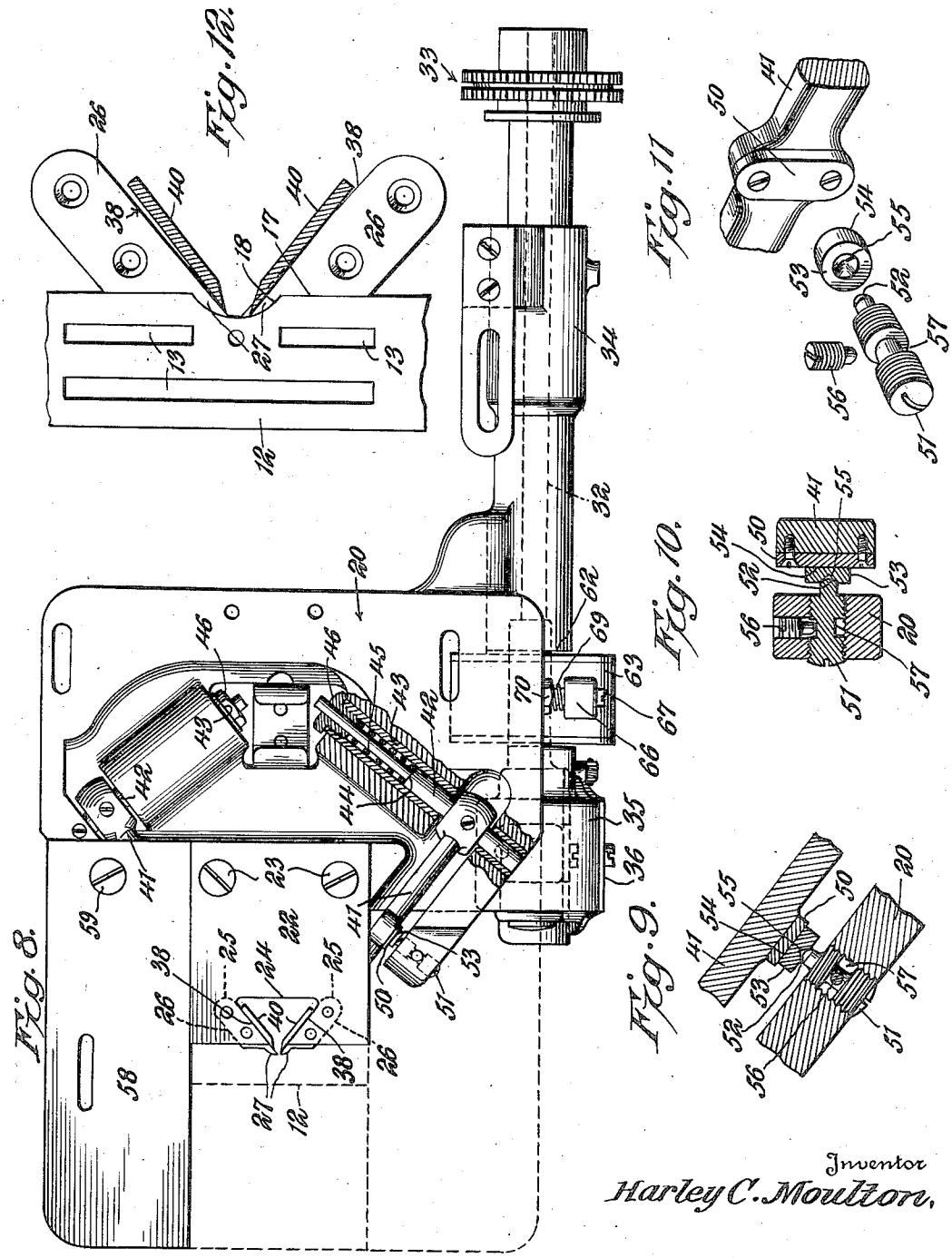
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COMBINED SEAMING AND PINKING MACHINE

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Patented Feb. 18, 1936 2,031,545

UNITED STATES PATENT OFFICE

2,031,545

COMBINED SEAMING AND PINKING MACHINE

Harley C. Moulton, Maplewood, Mo., assignor to Lewis Invisible Stitch Machine Company, St. Louis, Mo., a corporation of Maine

Application September 17, 1934, Serial No. 744,445

22 Claims. (Cl. 112—122)

This invention relates to new and useful improvements in sewing machines especially adapted for performing simultaneously both seaming and pinking operations, and in the accomplishment of certain of its objects seeks particularly to improve machine structures of the nature of those disclosed in the Mann Patent 1,962,022, issued June 5, 1934.

Among the several objects of the invention are included the provision of novel alternately reciprocable cutters and adjustable or controllable means for yieldably holding the cutters against the cooperating ledger blades in a manner preventing objectionable wearing of the blades and obviating the necessity of the depending fingers usually carried by the cutter blades and constantly engaging the ledger blades to retain cutting relation; to provide a novel pinking mechanism which can be readily attached to and removed as a unit from any sewing machine and which includes work guiding and operator guarding devices; and to not only provide novel pneumatic means for ridding machine portions adjacent the cutting or pinking area of the minute particles of fabric resulting from the pinking operation but to so construct said means as to build it into the pinking unit so as to be mountable and removable therewith.

With these and other objects in view which will more fully appear, the nature of the invention will be more clearly understood by following the description, the appended claims, and the several views illustrated in the accompanying drawings.

In the drawings:—

Figure 1 is a rear elevation of a combined seaming and pinking machine embodying my invention.

Figure 2 is a left elevation, the overhanging arm being shown in section.

Figure 3 is a detail plan view illustrating portions of the work support base and the base plate or body casting removably mounted thereon, the power transmitting connections with the needle shaft being broken away.

Figure 4 is a detail vertical longitudinal section along the axis of the driver shaft.

Figure 5 is a detail vertical cross section illustrating the means for pneumatically disposing of cut bits of fabric.

Figure 6 is a detail vertical cross section taken through the blower chamber.

Figure 7 is a detail perspective view of one of the reciprocable cutter blades.

Figure 8 is an inverted plan view of my improved pinker attachment.

Figure 9 is a detail horizontal section showing the adjustable bearing between the base plate and a blade carrying arm.

Figure 10 is a detail vertical cross section of the parts shown in Figure 9.

Figure 11 is a detail perspective view illustrating the adjustable bearing parts separated.

Figure 12 is a somewhat diagrammatic plan view illustrating the angular relation of the cutting edges, one reciprocating blade being shown up and one down.

Like reference numerals designate corresponding parts throughout the several figures of the drawings.

In the drawings, 5 designates the frame base or work support of a sewing machine embodying my invention and which includes the usual frame standard 6 supporting an overhanging arm 7 and the sewing head 8 mounted on the free end of said arm.

A main or needle shaft 9 is rotatably mounted in the overhanging arm, and the needle bar 10 vertically reciprocable in the sewing head and carrying the needle 11, is given a complete reciprocation for each rotation of the shaft 9 by the usual driving connections such as are shown in the Mann patent hereinbefore referred to.

A throat plate 12 is mounted on the work support base 5 and is slotted as at 13 to accommodate the intermittent 4-motion feed dog 14 which is moved by the usual driving devices disclosed in the Mann patent. A presser foot 15 cooperates with the feed dog 14 in the usual manner, and beneath the throat plate 12 is mounted a looper or other complemental stitch forming means 16 driven in the usual manner as disclosed in the Mann patent referred to above.

All of the parts above described will be recognized as conventional, except insofar as they combine with the pinking mechanism to be described hereinafter, and details of construction of these parts form no part of my present invention.

In the practical development of the invention, I provide the throat plate 12 with an abutment shoulder 17 just to the right of the needle 11 and parallel the direction in which the work is fed past the needle. The abutment shoulder is provided with an arcuate recess 18 close to and at the right side of the needle. The main body portion of the throat plate is on a plane with the top face of the frame base 5 and is provided

with a triangular cutout or clearance, the apex of which is directed toward and lies adjacent the needle.

My improved pinking devices are assembled in the form of an attachment mountable and removable from the sewing machine frame base 5 as a unit. This attachment includes a base plate or casting body 20 removably secured by machine screws 21 to the frame base 5. A flat nose plate 22 is removably secured as at 23 in a recess formed in the under surface of the casting body 20 and extends toward the left from said body to abut the shoulder 17 as illustrated in Figure 3 of the drawings. The extended plate 22 is provided with a cutout or clearance 24 shaped and positioned for registering with the clearance 19 formed in the throat plate. At two sides of the clearance 24 the plate 22 is recessed as at 25 to removably receive a pair of ledger blades 26. The ledger blades thus bear angular relation one to the other and define the combined clearances 19, 24. The merging ends of the ledger blades extend beyond the nose plate 22 and are curved as at 27 to accurately fit in the recess 18 formed in the throat plate abutment shoulder 17. By this means the effective cutting edges of the ledger blades are disposed at one side of and very close to the reciprocating needle 11.

The casting body or base plate 20 includes bearing standards 28 in which a horizontally disposed jack shaft 29 has rotative bearing. The jack shaft carries a large worm wheel 30 and is driven by a small worm gear 31 bearing 1-to-2 driving ratio and secured upon a driver shaft 32 to which rotation is imparted by sprocket and chain connections 33 with the main or needle shaft 9. The base plate or casting body 20 also includes a bearing extension 34 for the driver shaft 32, and it will be observed that the jack shaft is disposed transversely with respect to the needle shaft 9 whereas the driver shaft 32 extends longitudinally at one side of and in parallel relation to the needle shaft. See Figures 1 and 3. The gearing 30, 31 is suitably housed in a casing portion 35 forming a part of the casting body 20 and this casing portion has an open face which is closed by a removable cover 36 so that access may be had to the gearing. The sprocket and chain equipment 33 likewise is enclosed in a suitable protective casing generally designated 37.

As previously stated the cutting edges 38 of the ledger blades 26 are disposed in angular relation and these stationary cutting edges are adapted to be alternately engaged by cutting edges 39 formed at the lower extremities of the movable cutter blades 40. As will be observed by reference to Figures 2, 5 and 7, the cutter blades 40 are straight edge blades easily sharpened and unencumbered by any depending ledger blade engaging fingers or lugs.

Each of the movable cutter blades 40 is removably secured to a carrier arm 41 which is vertically oscillatable about a horizontal pivot shaft 42 which is longitudinally shiftable in a sleeve bearing 43 provided therefor in the casting body or base plate 20, and as the arms 41 oscillate vertically about their pivotal mounting the blades 40 will be alternately reciprocated into and entirely out of engagement with the ledger blades. It will be observed by reference to Figure 5 of the drawings that it is possible to silence the blades 40 with the cutting edges 39 of both thereof elevated a considerable distance above the ledger blades.

Each pivot shaft 42 is provided with a reduced end forming a shoulder 44, and a coil spring 45 is interposed between each shoulder and a sleeve plug or bushing 46 which is adjustably threaded into the end of the bearing 43. The springs 45 tend to press the cooperating cutting edges of the ledger and cutter blades into efficient shearing relation and by adjustment of the plugs 46 the spring effect may be varied. A pair of eccentrics 47 are mounted on the jack shaft 29 and are spaced 180° apart. The blade carrier arms 41 are provided with ears 48 which are connected by strap links 49 with the eccentrics and by this means the cutter blades 40 are alternately reciprocated into and entirely out of engagement with the ledger blades.

Attached to the outer face of each carrier arm 41, at a point intermediate the blade 40 and the pivot 42, is a hardened metal bearing plate 50. An adjusting screw 51 is threadably engaged in an opening formed in the base plate or casting body 20 and the inner end of this screw is provided with a rounded portion 52 which registers with the bearing plate 50. A floating washer or plate 53 is provided with a flat inner face 54 for engagement with the respective bearing plate 50, and with a conical recess 55 in its outer face for receiving the rounded end of the screw 51 to thereby support the washer 53 against the plate 50. By adjusting the screw 51 the relative positions of the parts may be adjusted to enable them to absorb a greater or lesser degree of pressure exerted by the coil springs 45 so that the yieldable shearing engagement between the ledger and cutting blade cutting edges may be controlled to a nicety. It will be observed by reference to Figure 12 of the drawings that the respective cutting edges 38 and 39 bear slight angular relation whereby the portions farthest to the right of the needle first engage causing a shearing cut to be made progressively from right to left. This peculiar arrangement and control of engagement of the cutting edges makes possible the use of reciprocating cutting blades devoid of the usual depending fingers or lugs and the disadvantages of undesirable wear and interference experienced by use of such fingers or lugs have thus been done away with.

In order to prevent complete removal of the adjuster screws 51, I provide set screws 56 which engage in annular recesses 57 in the screws 51, the grooves being wide enough to permit the movement of the screws 51 necessary for adjustment.

An extension plate 58 is removably secured as at 59 to the base plate or casting body 20 and carries work guiding equipment 60 and operator guarding equipment 61. By thus rigidly connecting this equipment with the pinker attachment, it is removable as a unit with said attachment.

The bearing extension 34 is divided as at 62 to accommodate a blower casing 63 which is pivotally supported as at 64 on said bearing extension. The blower includes the usual impeller 65 operable in the chamber provided within the blower casing and secured on the driver shaft 32.

The blower casing 63 includes an extended apertured ear 66 and an adjuster screw 67 passes through the ear and into a threaded bore 68 provided in the casting body. A coil spring 69 encircles the screw 67 between the ear and a jamb nut 70 mounted on said screw. By adjusting the screw 67 it is possible to vary the position of the impeller within the blower casing.

The blower casing includes a screened inlet 71 and an outlet 72 which is connected by a rubber hose 73 with a duct 74 formed in the casting body and communicating with a wide shallow discharge opening 75 formed in the nose plate 22. It will be observed by reference to Figures 5 and 8 of the drawings that the discharge passage 75 delivers into the combined clearances 19, 24. The blast air from the blower is thus directed into the clearance in which the pink cutting action takes place and into the angle formed by the cooperating cutting blades, the blast traversing the path of reciprocation of said blades and effectively serving to rid the cutting zone of the cuttings resulting from the pink cutting operation.

It is of course to be understood that the details of structure and arrangement of parts may be variously changed and modified without departing from the spirit and scope of my invention.

I claim:

1. A combined seaming and pinking machine including a reciprocable needle and a work supporting base; and a pink cutting attachment mountable on and removable from the base as a unit and including a base plate, pink cutting means disposed in cooperative relation to said needle, and pneumatic means for disposing of the cuttings resulting from the pink cutting operation.

2. A combined seaming and pinking machine including a reciprocable needle and a work supporting base having clearance adjacent the needle; and a pink cutting attachment mountable on and removable from the base as a unit and including a base plate having a clearance registering with the base clearance, pink cutting means operating in the base plate clearance, and a blower for disposing of the cuttings resulting from the pink cutting operation and having a discharge duct directed into said base plate clearance.

3. A combined seaming and pinking machine including a reciprocable needle, individual reciprocable pink cutters disposed in angular relation and in cooperative relation to said needle and active to form cooperating pink forming cuts, and a blower for disposing of the cuttings resulting from the pinking cutting operation and having a discharge duct directed into the cutting angle formed between said cutters.

4. A combined seaming and pinking machine including a reciprocable needle and a work supporting base having clearance adjacent the needle, individual reciprocable pink cutters disposed in angular relation and active in said clearance to form cooperating pink forming cuts, and a blower for disposing of the cuttings resulting from the pink cutting operation and having a discharge duct directed into the clearance between the cutters.

5. A combined seaming and pinking machine including a reciprocable needle and a work supporting base having clearance adjacent the needle; and a pink cutting attachment mountable on and removable from the base as a unit and including a base plate having a clearance registering with the base clearance, individual reciprocable pink cutters disposed in angular relation and active in said clearance to form cooperating pink forming cuts, and a blower for disposing of the cuttings resulting from the pink cutting operation and having a discharge duct directed into the registering clearances between the cutters.

6. A pinking attachment mountable on and removable from a standard sewing machine comprising a base plate, a jack shaft rotatably supported on said plate, a driver shaft rotatably supported on said plate and having driving connection with the jack shaft and provision for driving connection with the needle shaft of a sewing machine, pink cutting means supported on said plate and having driving connection with the jack shaft, and a blower supported on said plate and having driving connection with one of said shafts and a discharge duct directed toward said cutting means for disposing of the cuttings resulting from the pink cutting operation.

7. A pinking attachment mountable on and removable from a standard sewing machine comprising a base plate, a transversely disposed jack shaft rotatably supported on said plate, a longitudinally disposed driver shaft rotatably supported on said plate in position for paralleling the needle shaft of a sewing machine and having driving connection with the jack shaft and provision for driving connection with the needle shaft of a sewing machine, pink cutting means supported on said plate and having driving connection with the jack shaft, and a blower supported on said plate and having driving connection with the driver shaft and a discharge duct directed toward said cutting means for disposing of the cuttings resulting from the pink cutting operation.

8. A combined seaming and pinking machine including a reciprocable needle, pink cutting means disposed in cooperative relation to said needle, a driver shaft, a longitudinal bearing for said shaft, driving connections between said shaft and said cutting means, and a blower having a discharge duct directed toward said cutting means for disposing of the cuttings resulting from the pink cutting operation, said blower including an impeller secured on said shaft, a casing surrounding and providing a working chamber for the impeller, and means for shiftably supporting said casing to enable varying the position of the impeller in the chamber.

9. A combined seaming and pinking machine including a reciprocable needle, pink cutting means disposed in cooperative relation to said needle, a driver shaft, a longitudinal bearing for said shaft, driving connections between said shaft and said cutting means, and a blower having a discharge duct directed toward said cutting means for disposing of the cuttings resulting from the pink cutting operation, said blower including an impeller secured on said shaft, a casing surrounding and providing a working chamber for the impeller, and means for swingably supporting said casing on said bearing to enable varying the position of the impeller in the chamber.

10. A combined seaming and pinking machine including a reciprocable needle, pink cutting means disposed in cooperative relation to said needle, a driver shaft, a longitudinal bearing for said shaft and a support for said bearing, driving connections between said shaft and said cutting means, and a blower having a discharge duct directed toward said cutting means for disposing of the cuttings resulting from the pink cutting operation, said blower including an impeller secured on said shaft, a casing surrounding and providing a working chamber for the impeller, means for swingably supporting said casing on said bearing to enable varying the position of the impeller in the chamber, said last

named means including a pivot pin for supporting the casing, an apertured ear projecting from said casing, and a shifter screw passing through said ear and threadably engaging said support.

11. A combined seaming and pinking machine including a reciprocable needle, pink cutting means disposed in cooperative relation to said needle, a driver shaft, a longitudinal bearing for said shaft and a support for said bearing, driving connections between said shaft and said cutting means, and a blower having a discharge duct directed toward said cutting means for disposing of the cuttings resulting from the pink cutting operation, said blower including an impeller secured on said shaft, a casing surrounding and providing a working chamber for the impeller, means for swingably supporting said casing on said bearing to enable varying the position of the impeller in the chamber, said last named means including a pivot pin for supporting the casing, an apertured ear projecting from said casing, a shifter screw passing through said ear and threadably engaging said support, a jamb nut on said screw, and a cushion spring interposed between the ear and the support.

12. A combined seaming and pinking machine including a reciprocable needle, ledger blade equipment, individual reciprocable pink cutters disposed in cooperative relation to said needle, means to alternately reciprocate said cutters into and entirely out of engagement with said ledger blade equipment to form individual cuts bearing angular relation and cooperating to form said pinks, and means entirely independent of cutter and ledger blade equipment interengagement for controlling movement of the cutters when out of engagement with the ledger blades and pressure interengagement of the cutters and ledger blade equipment during actual cutting.

13. A combined seaming and pinking machine including a reciprocable needle, ledger blade equipment, individual reciprocable pink cutters disposed in cooperative relation to said needle, means to alternately reciprocate said cutters into and entirely out of engagement with said ledger blade equipment to form individual cuts bearing angular relation and cooperating to form said pinks, and adjustable and yieldable means entirely independent of cutter and ledger blade equipment interengagement for controlling movement of the cutters when out of engagement with the ledger blades and pressure interengagement of the cutters and ledger blade equipment during actual cutting.

14. A combined seaming and pinking machine including a reciprocable needle, ledger blade equipment, individual reciprocable pink cutters disposed in cooperative relation to said needle, means to alternately reciprocate said cutters into and entirely out of engagement with said ledger blade equipment to form individual cuts bearing angular relation and cooperating to form said pinks whereby it is possible to silence operation of said cutters with the cutters out of contact with and spaced a considerable distance from the ledger blade equipment.

15. A combined seaming and pinking machine including a reciprocable needle, a pair of ledger blades disposed in angular relation adjacent the needle, a pair of individual reciprocable pink cutters, means to alternately reciprocate said cutters into and entirely out of engagement with said ledger blades to form individual cuts bearing angular relation and cooperating to form said pinks whereby it is possible to silence operation of said cutters with the cutters out of contact with and spaced a considerable distance from the ledger blade equipment, the engaging edges of each cutter and cooperating ledger blade bearing slightly angled relation to assure a shearing cut.

16. A combined seaming and pinking machine including a reciprocable needle, a pair of ledger blades disposed in angular relation adjacent the needle, a pair of individual reciprocable pink cutters, means to alternately reciprocate said cutters into and entirely out of engagement with said ledger blades to form individual cuts bearing angular relation and cooperating to form said pinks whereby it is possible to silence operation of said cutters with the cutters out of contact with and spaced a considerable distance from the ledger blade equipment, the engaging edges of each cutter and cooperating ledger blade bearing slightly angled relation to assure a shearing cut, and means entirely independent of cutter and ledger blade interengagement for controlling movement of the cutters when out of engagement with the ledger blades and pressure interengagement of the cutters and the ledger blades during actual cutting.

17. A combined seaming and pinking machine including a reciprocable needle, a pair of ledger blades disposed in angular relation adjacent the needle, a pair of individual reciprocable pink cutters, means to alternately reciprocate said cutters into and entirely out of engagement with said ledger blades to form individual cuts bearing angular relation and cooperating to form said pinks, spring means urging each cutter toward its companion ledger blade to assure an efficient shearing cut, and means entirely independent of cutter and ledger blade engagement for controlling movement of the cutters and limiting the effect of said spring means.

18. A combined seaming and pinking machine including a reciprocable needle, a pair of ledger blades disposed in angular relation adjacent the needle, a pair of individual reciprocable pink cutters, means to alternately reciprocate said cutters into and entirely out of engagement with said ledger blades to form individual cuts bearing angular relation and cooperating to form said pinks, spring means urging each cutter toward its companion ledger blade to assure an efficient shearing cut, and adjustable devices entirely independent of cutter and ledger blade engagement for controlling movement of the cutters and limiting the effect of said spring means.

19. A combined seaming and pinking machine including a reciprocable needle, a pair of ledger blades disposed in angular relation adjacent the needle, a pair of individual reciprocable pink cutters, a supporting base, a carrier arm for each cutter and means to swingably support said arms, means to swing said arms to alternately move the cutters into and entirely out of engagement with the ledger blades to form individual cuts bearing angular relation and cooperating to form said pinks, spring means cooperating with each arm for urging it in a direction for causing the cutter carried thereby to yieldably engage with its associated ledger blade, and means mounted on the base and engageable with a portion of each arm to control movement of the arm and to limit the effect of said spring means.

20. A combined seaming and pinking machine including a reciprocable needle, a pair of ledger blades disposed in angular relation adjacent the needle, a pair of individual reciprocable pink cutters, a supporting base, a carrier arm for each

cutter and means to swingably support said arms, means to swing said arms to alternately move the cutters into and entirely out of engagement with the ledger blades to form individual cuts bearing angular relation and cooperating to form said pinks, spring means cooperating with each arm for urging it in a direction for causing the cutter carried thereby to yieldably engage with its associated ledger blade, means mounted on the base and engageable with a portion of each arm to control movement of the arm and to limit the effect of said spring means, and means for adjusting the spring effect of said spring means and for varying the effect of said movement controlling spring effect limiting means.

21. A combined seaming and pinking machine including a reciprocable needle, a pair of ledger blades disposed in angular relation adjacent the needle, a pair of individual reciprocable pink cutters, a supporting base, a carrier arm for each cutter and means to swingably support said arms, means to swing said arms to alternately move the cutters into and entirely out of engagement with the ledger blades to form individual cuts bearing angular relation and cooperating to form said pinks, spring means cooperating with each arm for urging it in a direction for causing the cutter carried thereby to yieldably engage with its associated ledger blade, and means mounted on the base and engageable with a portion of each arm to control movement of the arm and to limit the effect of said spring means, said last named means comprising a control bearing surface on each arm, a screw adjustably supported on the base adjacent each arm, and a floating bearing plate supported between each screw and the adjacent arm and engaging the bearing surface of said adjacent arm for the purpose specified.

22. In a combined seaming and pinking machine, the combination of a work base, stitch forming means including a reciprocating needle, a throat plate having an abutment shoulder to the right of the needle and paralleling the line of work feeding and having therein a receiving recess to the right of and close to the needle; and a pinking attachment including a base plate removably supported on the work base and having a portion abutting the shoulder, ledger blades disposed in angular relation and overhanging the base plate portion and engaging in the receiving recess, and cutting blades for cooperating with the ledger blades in cutting pinks.

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