Jan. 31, 1967 C. F. JOHNSON 3,301,585

SHEET AND PLATE HANDLING TOOL

Filed April 2, 1965

FIG. 1

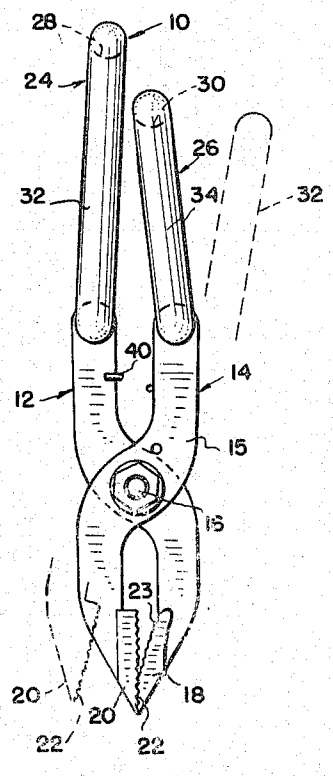


FIG. 2

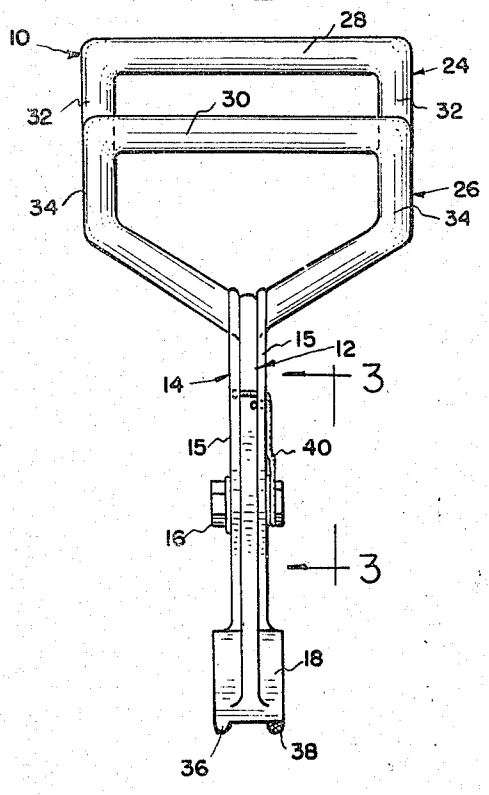


FIG. 3

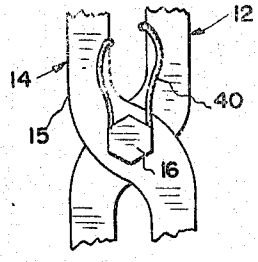
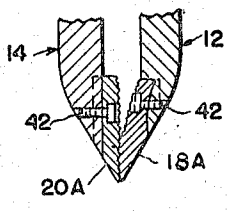


FIG. 4



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SHEET AND PLATE HANDLING TOOL

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This invention relates to work-gripping tools and, in particular, to tools for handling sheet or plate material.

Hitherto, the handling of sheet or plate materials, such as steel sheets in stacks, for the purpose of withdrawing a single sheet from the stack, has been accompanied by great difficulty and with occasional injury to the operator. Such operators have ordinarily used canvas gloves in order to protect their hands, but these gloves are frequently cut by the jagged edges of the sheets and such cuts frequently penetrate the hands of the workman. Moreover, it also involves a great expense due to the frequent changes of gloves to replace those worn out. The present invention eliminates the need for such gloves by providing a tool which quickly and easily selects, grips and withdraws sheet or plate material from a stack thereof with a powerful grip yet without injury to the operator.

Accordingly, one object of the present invention is to provide a sheet or plate handling tool which quickly and easily is inserted in a stack of sheets or plates to select and withdraw a single plate from the stack yet which exerts a powerful grip upon the sheet or plate in such a manner that the greater the weight of the sheet or plate or the greater the resistance to its withdrawal, the more powerful is the grip exerted by the device.

Another object is to provide a sheet or plate-handling tool of the foregoing character which increases the leverage and consequently the grip upon the sheet or plate as the thickness of the sheet or plate is increased, so that a more powerful leverage is exerted upon thick sheets or plates than upon thin ones.

Another object is to provide a sheet or plate handling tool of the foregoing character having gripping jaws with stack-penetrating teeth on one or both jaws, thereby facilitating the insertion of the jaws and the gripping of a particular sheet or plate which it is desired to withdraw from the stack.

Other objects and advantages of the invention will become apparent during the course of the following description of the accompanying drawings, wherein:

FIGURE 1 is a side elevation of the sheet or plate-handling tool of the present invention;

FIGURE 2 is a front elevation of the tool viewed from the right in FIGURE 1;

FIGURE 3 is a side elevation, looking in the direction of the arrows 3—3 in FIGURE 2; and

FIGURE 4 is a fragmentary vertical section through a modification of the invention employing renewable jaws.

Referring to the drawing in detail, FIGURES 1 and 2 show a sheet or plate handling tool, generally designated **10**, consisting of roughly Z-shaped outer double and inner single scissors levers **14** and **12** respectively disposed parallel to one another and having forward arms disposed in close proximity to one another with tapered forward ends and with the single lever **12** extending between the parallel opposite sides **15** of the double lever **14**, both being drilled in alignment to receive a pivot bolt **16** and carrying on their forward ends serrated jaws **18** and **20** respectively. The jaw **20** has a flat serrated gripping surface **22**, whereas the jaw **18** has a curved or arcuate serrated surface **23** which is convex toward the flat serrated gripping surface **22** and curves rearwardly away therefrom. By this arrangement a narrow sheet or plate is gripped near the outer

ends or tips of the jaws **18** and **20**, whereas a thick plate or sheet is gripped nearer the pivot bolt **16**, hence with a more powerful leverage exerted and consequently a more powerful grip is obtained.

Welded or otherwise secured rigidly to the ends of the levers **12** and **14** respectively so as to move unitarily therewith are open-centered approximately rectangular handles **24** and **26** of unequal lengths provided with cross members **28** and **30** respectively interconnecting the outer ends of their side portions **32** and **34** respectively. The shorter handle **26** on the outer lever **14** causes its cross member **30** to come to rest near the side portions **32** of the longer handle **24** with the cross portion **28** resting in the palm of the hand against the base of the user's thumb while the fingers encircle the cross portion **30** of the shorter handle **26**. This also gives a natural gripping position for the palm and fingers of one hand. The jaws **18** and **20** have tapered forward ends terminating in substantially sharp forward edges and have single inter-sheet penetration teeth **36** and **38** at one corner of their forward ends to facilitate insertion of the jaws **18** and **20** between the adjacent sheets of a stack of sheets containing the sheet to be withdrawn. When the tool is not in use and at rest, a torsion spring **40** with its loops surrounding the pivot bolt **36** and its opposite ends connected respectively to holes in the rearward arms of the levers **12** and **14**, urges the rearward arms of the levers **12** and **14** apart and consequently urges the forward arms thereof and their respective jaws **18** and **20** away from one another into their open position.

In the operation of the tool **10**, when the operator grasps the cross members **28** and **30** in one hand in the manner described above, and squeezes them between his palms and fingers, he moves the handles **24** and **26** laterally toward one another, closing the gap between the jaws **18** and **20** until they will just barely go over the sheet to be grasped, with the teeth **36** and **38** pushing away the adjacent sheet or sheets with a wedging apart action. The operator then squeezes fully upon the cross members **30** and **28** to completely close the jaws **18** and **20** upon the opposite sides of the sheet or plate and pulls upon it to withdraw it. The cross member **30** on the shorter handle **26** meanwhile moves laterally toward the side portions **32** of the longer handle **24**, thereby exerting a kind of toggle action on the sheet which requires only the pressure of the finger to hold the sheet while the weight of it is carried by the arms and shoulder muscles.

For purposes of simplicity of illustration, the jaws **18** and **20** of the sheet or plate handling tool **10** of FIGURES 1 to 3 inclusive have been shown as permanently attached to their respective levers **12** and **14**. In actual practice, however, these jaws undergo wear during protracted use, particularly as regards the sharpness of the serrations with which their surfaces **22** and **23** are provided. Accordingly, it is contemplated that the jaws **18** and **20** in the commercial form of the invention will be made removable and therefore replaceable as shown in FIGURE 4, wherein removable jaws **18A** and **20A** are shown as bolted at **42** to their respective levers **12** and **14**.

What I claim is:

1. A sheet or plate gripping tool, comprising

a pair of scissors levers disposed in crossing relationship intermediate their forward and rearward ends and having forward arms disposed in close proximity to one another in the closed position thereof and terminating in tapered forward ends,

a pivot element pivotally interconnecting said levers at their crossing location,

a pair of gripping jaws mounted on the forward ends

of said levers and having substantially sharp forward edges, resilient means engaging said levers and urging said jaws away from one another into the open position thereof,

and an open-centered handle mounted rigidly on the rearward end of each lever and movable unitarily therewith,

each handle having opposite side portions connected at their forward ends to its respective lever and a cross portion interconnecting the rearward ends of said side portions,

said cross portions being disposed transversely to their respective levers,

the cross portion of one handle being disposed nearer said pivot element than the cross portion of the other handle and movable into close proximity to the side portions of said other handle in longitudinally-spaced relationship to the cross portion of said other handle.

2. A sheet or plate gripping tool, according to claim 1, wherein said handles converge rearwardly toward one another in the closed position of said levers and wherein the cross portion of the handle disposed nearer the pivot element than the cross portion of the other handle is separated from said cross portion of said other handle by a space equal at least to the diameter of one of said cross portions.

3. A sheet or plate gripping tool, according to claim 1, wherein said levers are approximately Z-shaped with substantially parallel forward arms carrying said jaws and with substantially parallel rearward arms disposed approximately parallel to substantially parallel forward arms.

4. A sheet or plate gripping tool, according to claim 1, wherein one of said jaws has a substantially flat serrated gripping surface in a direction longitudinally of its respective lever and wherein the other of said jaws has a serrated gripping surface of arcuate configuration in a direction longitudinally of its respective lever and which is convex toward said flat gripping surface.

5. A sheet or plate gripping tool, according to claim 4, wherein the other of said jaws has the forward end of its arcuately-configured gripping surface disposed close to the forward end of said substantially flat gripping surface of said one jaw and has said arcuately-configured gripping surface curved rearwardly away from said substantially flat gripping surface.

6. A sheet or plate gripping tool, according to claim 1, wherein said jaws have forwardly-projecting inter-sheet penetration teeth secured to their respective forward ends.

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