

- [54] **STENCIL TYPE CHALK FABRIC MARKER**
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[51] Int. Cl..... **B41f 15/20**

[58] Field of Search..... 101/114, 115, 126; 112/131, 121.25; 222/108, 193; 118/301, 406, 505

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[57] **ABSTRACT**

Marking apparatus characterized by at least two similar, scale inter related relatively movable marking units having horizontally co-planar frames holding perforated patterns for upward projection of powdered chalk through the perforation onto workpieces; the top frames are supported by collection chutes terminated below by vessels for collecting excess chalk powder; a co-acting compressed-air system for supplying chalk-powder from vessels terminates in upwardly directed nozzles beneath the perforated patterns; the chalk supply vessels and the chalk recovery vessels are interchangeable, Novel pattern structure is also disclosed.

1 Claim, 5 Drawing Figures

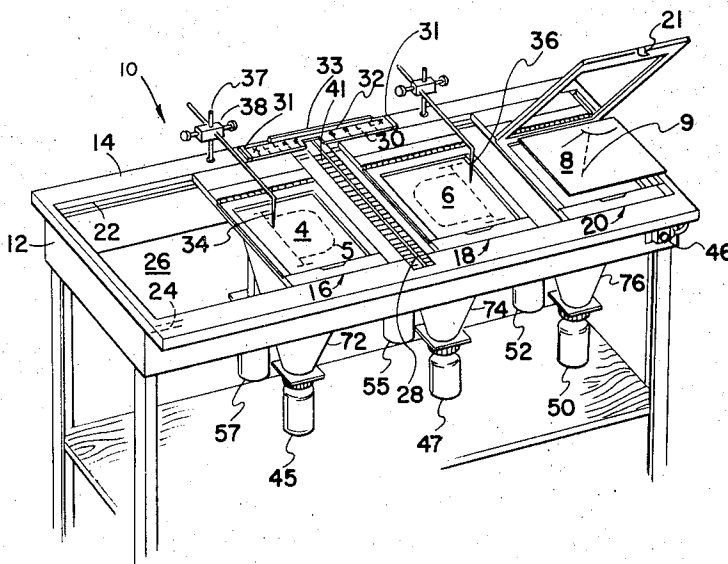


FIG. 1

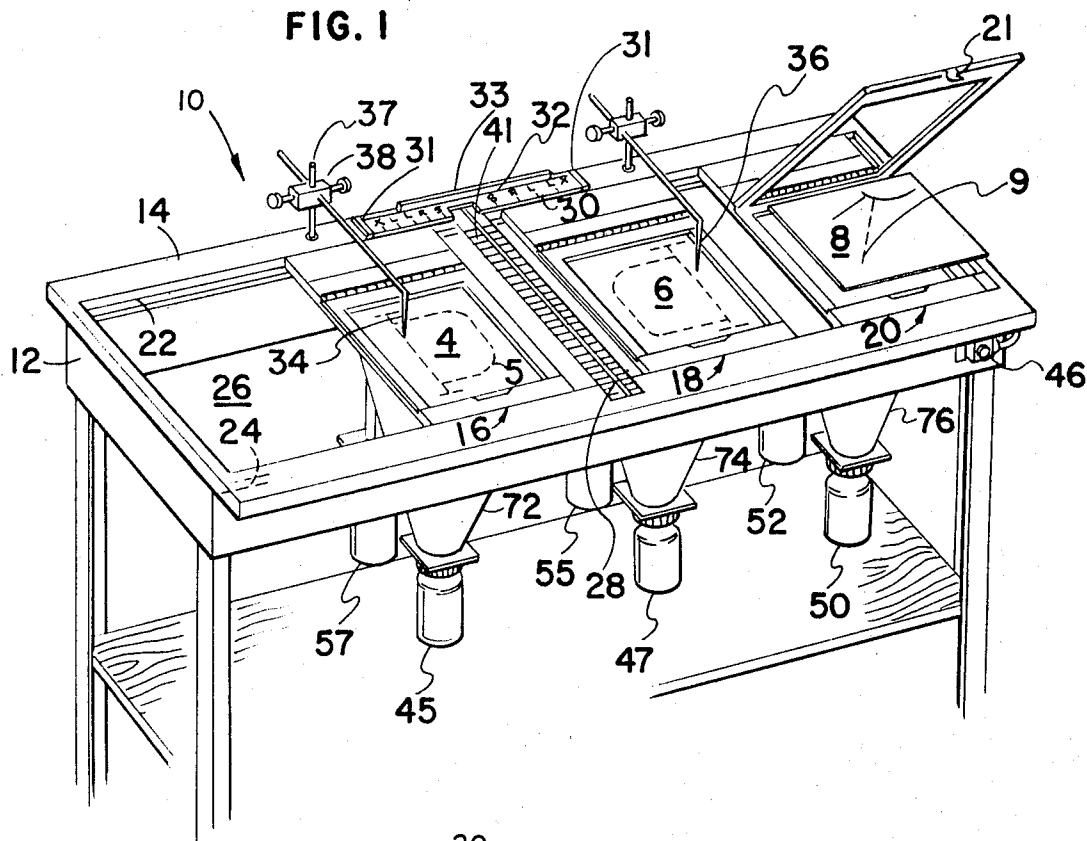
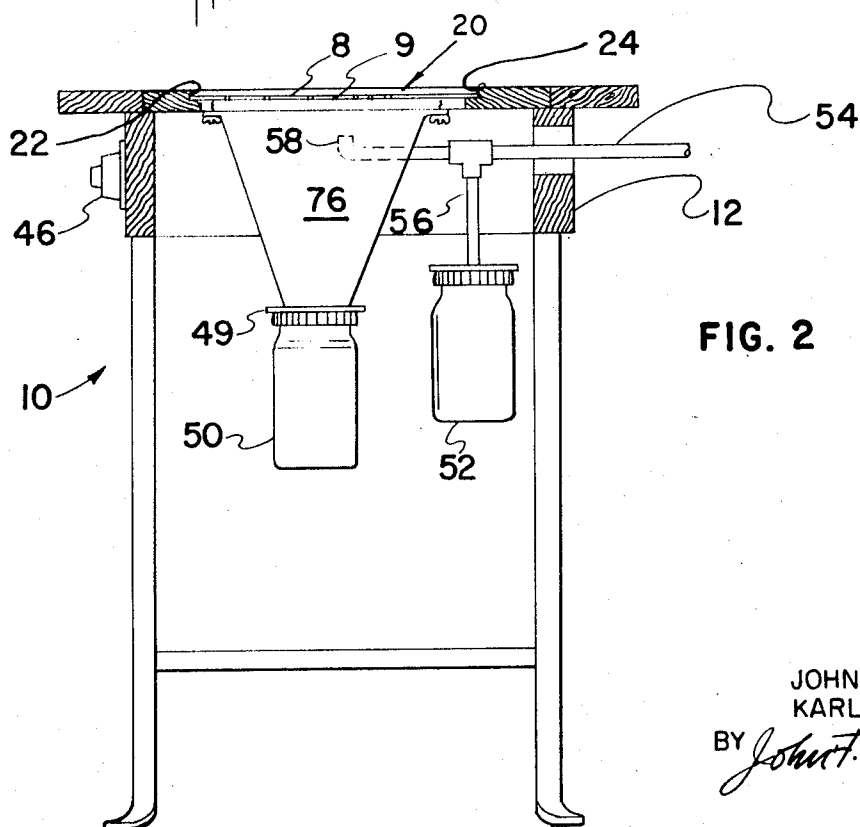


FIG. 2



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FIG. 3

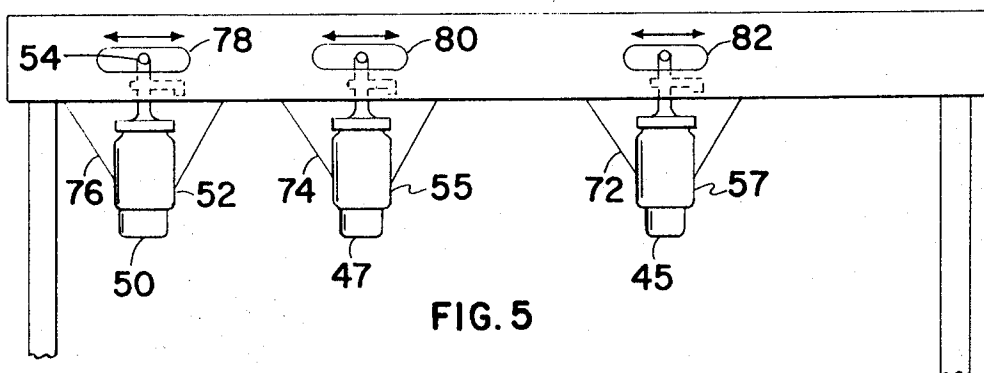
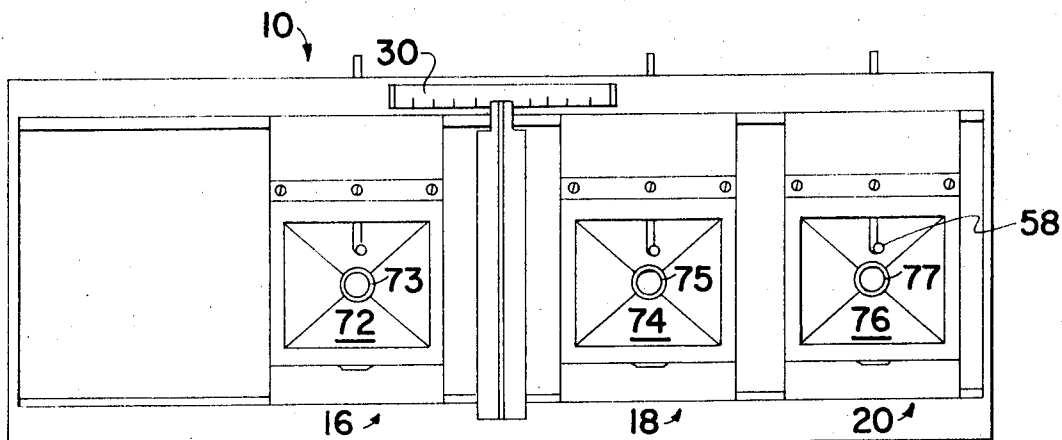


FIG. 5

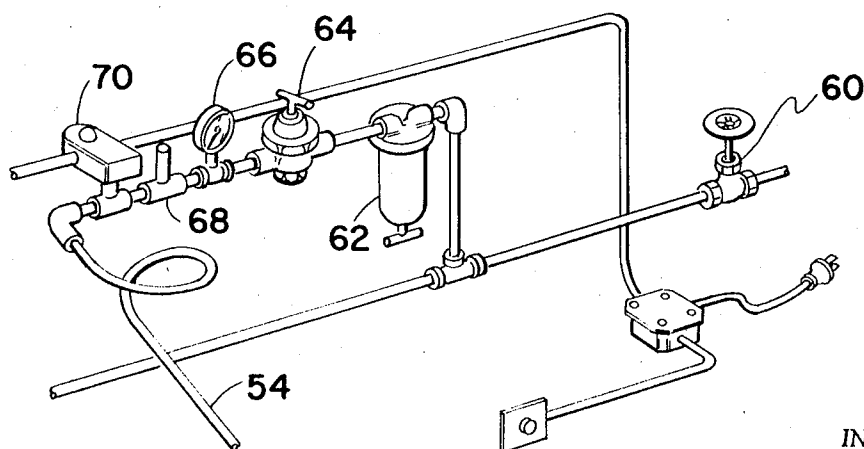


FIG. 4

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STENCIL TYPE CHALK FABRIC MARKER

This invention relates generally to coating-type markers and specifically to markers of the type used for chalk-coating outline markings on fabric for sewing and cutting guidance. Such markings are essential for indicating locations of buttonholes, pockets, flaps, and the like, and are elsewhere useful for linear-marking any flat material which is receptive to chalk powder.

In the prior art, many variations of marking devices have been suggested, but no practical high speed marker has been disclosed which has found universal acceptance as meeting the actual day-to-day needs of industry. Although chalk-blast stencilling has been used for fabric guide-marking for fifty years because of the non-staining, non-toxic, economical nature of the process, the apparatus and techniques used have not been flexible, and practical embodiments have been limited.

Among the difficulties with chalk-blast marking systems have been the following:

Chalk powder absorbs moisture from surrounding air when the powder is chilled by expansion of compressed air used to apply the powder. The moisture cements chalk stored in open bins causing "channeling" by compressed air and non-uniform pick-up. The moisture also causes tubes and other conduits to be clogged, and especially tends to clog the pinhole outlets used to define patterns, preventing reliable marking operations. Motorized vibration and sweeping devices and vacuum systems employed to correct these difficulties tend to prevent ready access to the work area and add to equipment cost, while at the same time requiring extra adjustment and maintenance. In particular such added devices tend to restrict the variety and size of patterns usable, and to increase cost of pattern materials, because the patterns used with them must be very durable.

Where flat patterns are necessary, as for pocket marking as opposed to hem-line marking, for example, symmetrical pieces of varying lengths are marked. This requires extending the chalk supply and recovery system, increasing water pickup difficulties and decreasing reliability.

It is therefore a principal object of this invention to provide an improved marker for flat garment work which is superior in all aspects to previously available devices for the purpose as proven by actual use in high-volume garment manufacturing operations.

Other objects are to provide a garment marker as described which is characterized by maximum speed in output, in pattern changeover, in adjustment, and in cleaning and charging.

Further objects are to provide a garment marker as described, which provides unobstructed table-top access and support for the work, which is precise, reliable, and self-checking in marking, and which is adapted to receive and uniformly mark a wide range of sizes including simultaneously marking symmetrical pieces of extended length.

And further objects are to provide a garment marker as described which is of effective, straightforward design employing commercially available components for compressed-air handling and easily obtainable materials for the other parts, which is economical to make and to operate, and which requires minimum operator training.

And finally, a very important object of the invention is to provide an improved means for producing patterns for garment marking machines of the type described.

A representative embodiment of the unique marker of this invention includes at least two similar, scale inter related relatively movable marking units having co-planar top frames holding perforated patterns, chutes depending from the frames and supporting collection vessels at the lower ends of the chutes; a compressed-air system having chalk powder supply pressure vessels, preferably interchangeable with the collection vessels, nozzle outlets beneath the patterns connected with the pressure vessels, and a work locating system. Paper-board pattern structure and perforation method is also a part of the invention.

The above and other features, objects and advantages of this invention will become more readily understood on examination of the following description, taken in conjunction with the drawings, in which:

FIG. 1 is a perspective view of the marking apparatus of this invention;

FIG. 2 is a side elevation detail of the relation of chalk powder projecting and collecting elements with the perforated pattern;

FIG. 3 is a plan view of details of the marking apparatus;

FIG. 4 is a perspective detail of a portion of the compressed air treatment and control system of the invention; and

FIG. 5 is a detail of the back of the marking apparatus.

Turning now to the Figures in detail, FIG. 1 illustrates in perspective the working surfaces of the marker 10 in association with the indexing indicators and control.

Pieces to be marked are laid on the working surfaces of the marker and chalk powder is projected upward through perforated patterns or projected 4, 6, 8 to mark the pieces.

The marker is in the general form of a table 12 having an apertured top 14 mounting frame assemblies 16, 18, 20, which hold the respective patterns 4, 6, 8. The frame assemblies are movably supported in opposed ledges 22, 24 running the length of the table on either side of the top aperture 26 to provide for individual longitudinal-position adjustment of the frame assemblies.

As indicated by opened frame assembly 20, changing the pattern is accomplished by releasing a spring latch 21, opening the hinged frame assembly 20, substituting a new pattern, and closing the frame assembly.

An upwardly ridged stop guide 28, affixed across the top aperture 26 midway the length of the table provides a bench mark for the longitudinal-position adjustment of the frames.

A quickly detachable scale 30 is secured by stops 31, 33 on the table top to provide index marking symmetrically on either side of the stop guide 28 by means of grading markings 32 on the scale for determining relative location of the respective frame members and of said sheet material to be marked.

Downturned clamp-adjusted pointers 34, 36, suspended above the patterns adjacent the stop guide indicate reference points on the respective patterns to insure that pieces are properly positioned over the patterns when the patterns are hidden by pieces to be marked. These pointers also provide for a high-degree

of self-checking on installation of patterns as well as during operation. Since the pointers are mounted on the table top, any accidental dislodgement of the movably supported (slidable) frame assemblies will be indicated. Graduations 41 on the stop guide supply the second points needed in conjunction with the pointer-located points to orient work pieces properly with respect to the patterns. Each pointer is adjustably affixed to the table top by a stand 37 and clamp 38.

Chalk powder is drawn from chalk storage vessels 52, 55, 57 below the respective frames and projected upward through the respective perforated patterns when the operator presses a control switch 46. Excess chalk is caught in vessels 45, 47, 50 beneath the individual frames.

FIG. 2, a sectional detail in side elevation, shows table 12, with ledges 22, 24 supporting a frame assembly 20. A tapered chute 76 in the form of an inverted truncated pyramid is screwed to the underside of each frame assembly. The upper, larger end of the chute forms an airtight fit around the frame. The lower, smaller end of the chute ends in a plate 49 which is adapted to receive and hermetically but detachably secure a pressure vessel 50 of the type ordinarily used in compressed-air paint spray systems.

This vessel receives excess chalk dust collected by the chute until the vessel is filled, at which time it is disconnected and interchanged with the chalk supply vessel 52, which by that time is empty and ready for use as chalk is collecting vessel.

The chalk supply vessel 52 feeds powdered chalk into compressed air received through flexible conduit 54 from an air system supplied for the purpose. The pressurized air passing across the top of conduit 56, which extends into supply vessel 52, draws chalk dust from the supply vessel and exhausts the chalk-air mixture from an upwardly directed nozzle 58 led into the airtight chute 76 beneath the pattern 8.

As result of the upward direction of the nozzle 58 and of the buildup in pressure in airtight chute 76, the chalk-air mixture is forcefully expelled through the perforations 9 in the pattern, thus marking any workpiece (not shown) laid on the pattern for the purpose.

Since each frame is individually supplied with a chalk powder projection and collection system of the type described, a wide range of spacing adjustment is made available while at the same time preventing exposure of large beds of chalk to the ambient air.

FIG. 3 is a plan view showing the chutes 72, 74, 76 with the patterns removed. The lower orifices 73, 75, 77 lead to the chalk powder collection vessels. As indicated, the construction of the chutes is very straightforward. Galvanized sheet steel or soft aluminum is suitably bent and joined to form the chutes with the upper and lower fittings sweated or welded in place.

In order to provide more working surface and, if desired on long runs, to secure the spacing of the movably supported (slidable) frame assemblies, plain panels can be fitted in the open spaces of the table top.

FIG. 4 shows the compressed-air treatment and control system employed. Preferably one such system is provided for each frame assembly. Compressed air (or other gas such as carbon dioxide or dry nitrogen) from a source not shown is supplied through a cutoff valve 60, a filter 62, a pressure regulator 64, a pressure indicator 66, a safety pop-off valve 68, and a solenoid valve 70 (controlled by electric switch 46, FIG. 1) and flexi-

ble conduit 54 to the individual frame assembly. This arrangement assures even delivery by keeping each chalk powder projection system pneumatically independent of the others. Clean, dry chalk powder delivery is thus provided with maximum reliability.

FIG. 5, a rear elevation, details the relation of various parts at the rear of the table. Since the individual frame assemblies are relatively movable as indicated by the arrows, slots 78, 80, 82 allow the compressed air lines leading to the chalk powder supply vessels 52, 55, 57 to move and adjust with the individual frame assemblies.

Many advantages of this invention will be noted from the foregoing description.

The operator is provided with a marker of great flexibility, speed, and precision which is at the same time simple and economical to use.

Adjustment and operation are quick and easy: the proper patterns are set in the frame assemblies, spacing of the frame assemblies is adjusted, the pointers are set, and the marker is ready for production. In production, pieces are laid over the patterns in accordance with the proper guidemarks, the control button is pressed, marking the pieces instantly and accurately, and the process is repeated as often and quickly as desired. When the chalk powder supply in a chalk supply vessel runs low it is only the work of a moment to interchange the positions of the supply and the collection vessels.

When the marker is not in use, no special provision is necessary to preserve fluidity of the chalk powder, since the dry compressed air used fills the collection chutes during operation, and in the collection vessel there is minimum exposure to external or wet air when the machine is not in operation.

The production changeover, pattern grading and size adjustment are much simplified by co-acting features of this invention. Scale 30 is quickly substitutable by a scale having other desired markings, and, the patterns being cardboard, can be quickly made or altered using an ordinary hand-held starwheel to perforate the markings as required.

The provision of plural individually positionable frames not only makes the powder marking process more reliable, set-up and change-over times shorter, and production of symmetrical parts quicker and more uniform, but it also allows simultaneous length, seam, or trim markings to be made, as at 9, FIG. 1, on extensions of pieces being marked at other frames.

Obviously, many modifications and variations of the present invention are possible in light of the above teachings. It is, therefore, to be understood that within the scope of the appended claims the invention may be practiced otherwise than as specifically described.

What is claimed and desired to be secured by U. S. Letters Patent is:

1. In a powder-projection sheet material marking system having a pattern with perforations therein for passage of powder onto material to be marked and a system for collection and storage of powder projected against the pattern but not passed through the perforations, the improvement comprising:

a table having an aperture in the top,
first and second ledges lengthwise of the table along the respective first and second sides of the aperture,
plural frame assemblies spaced relative to each other in said top aperture,

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the ledges supporting each of said frame assemblies movably between the ledges, each frame assembly including:

a planar member having an opening for receiving a pattern, a pattern received in said opening, a frame securing the pattern in the opening, a chalk-powder collector chute fixed to the underside of the planar member, a first chalk-powder container having a detachable connection with the bottom of the chalk-powder collector chute for thereby collecting chalk powder, a nozzle in the chalk-powder collector chute, the nozzle upwardly directed at the pattern for projecting chalk powder through the pattern, a compressed-gas line connecting with the nozzle, a second chalk powder container detachably connecting with the compressed gas line for thereby supplying chalk powder to be projected, a portion of the compressed gas line being flexible, for thereby facilitating movement of the frame assembly along the aperture in the top of the table; means for orienting sheet material to be marked including a first scale,

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the first scale fixed across the width of the aperture in the table top, between at least two of said plural frame assemblies, thereby comprising a reference location for adjusting the position of one of said frames relative to another, the first scale having graduations along the length thereof for adjusting the position of sheet material to be marked relative to the first scale;

a second scale, the second scale detachably affixed along one side of the table past an end of the first scale, the second scale having markings thereon in each direction symmetrically relative to the reference location provided by the first scale for indexing the location of plural of said frame assemblies relative to each other, and

at least one pointer assembly affixed to the table and having an adjustable arm with a downturned end positionable over a pattern in one of said frame assemblies, for indicating and verifying the position of the frame assembly and pattern during the marking of sheet material on said sheet material marking system.

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