Feb. 7, 1961 D. A. FREEMAN 2,970,393

PRESS PLATE AND METHOD OF MAKING SAME

Filed March 29, 1957

Fig. 1

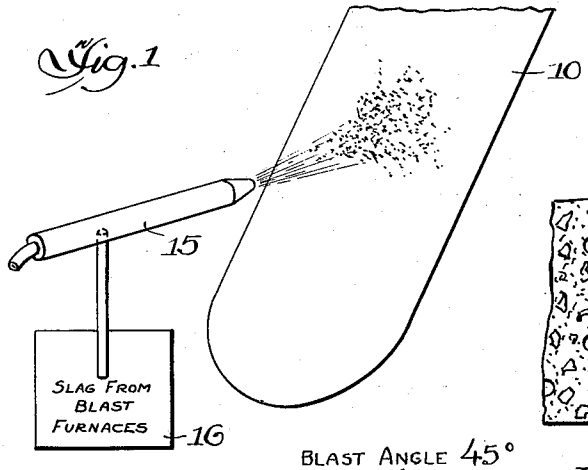


Fig. 2

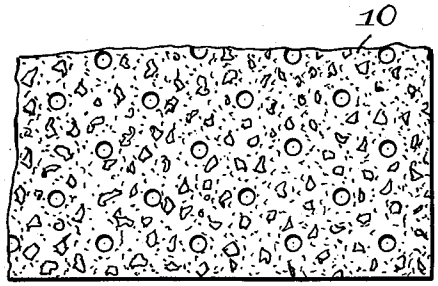


Fig. 3

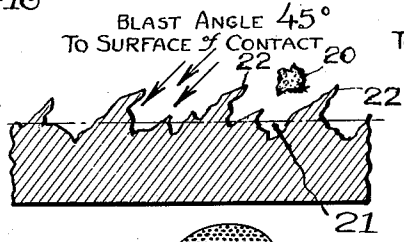


Fig. 3A

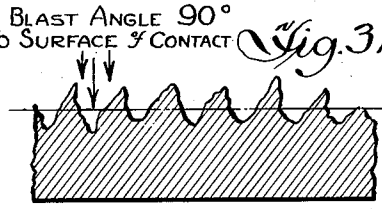


Fig. 4

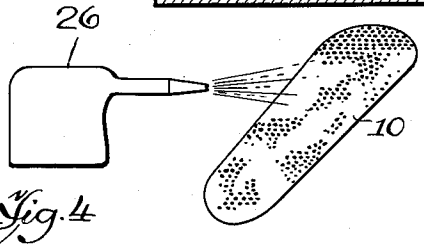


Fig. 5

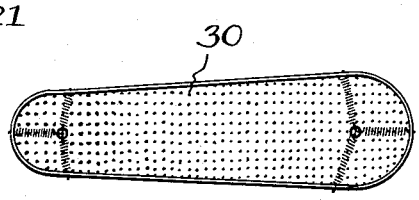


Fig. 6

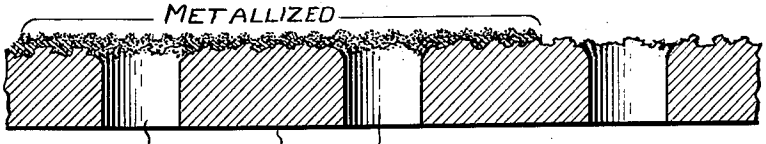
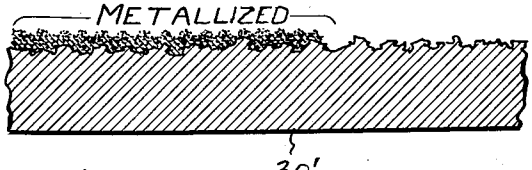


Fig. 7



Inventor,
David A. Freeman
By: Schneider & Dressler,
Attys.

United States Patent Office 2,970,393 Patented Feb. 7, 1961

2,970,393

PRESS PLATE AND METHOD OF MAKING SAME

David A. Freeman, The Drake Hotel, 140 E. Walton St., Chicago, Ill.

Filed Mar. 29, 1957, Ser. No. 649,526

4 Claims. (Cl. 38—66)

This invention relates to a press plate and method of making the same, and particularly to a press plate used in a garment press or the like.

As is well known, a garment press has a movable head cooperating with a buck. The head includes a steam chest supplied with steam from a suitable source or may be an electrically, gas or otherwise heated press head. The press plate may be a separate plate or form part of the head structure and for the purposes of this invention, the two will be considered as equivalent.

The buck may have a porous pressing surface, customarily of resilient material such as fabric or the like, and may have suction applied thereto during the pressing operation. The pressing surface of the garment head whether heated by steam, electricity or gas may be either steam permeable or not, as desired. Where the head pressing surface is permeable, steam is provided at the work surface.

For certain types of work, a so-called hot head action is desired, this being obtained by a solid press plate carried by the press head. In such case, the objective is to provide a hot press plate without steam passing through the press head to the work. Frequently the work will be dampened to generate a certain amount of steam.

The present invention is particularly concerned with the pressing surface and a method of treating the same to obtain the desired characteristics. The invention is applicable to the pressing surface whether the surface is on the head of the press or an independent press plate. Accordingly, the term "press plate" as used throughout this specification and claims refers to the element whose surface is the pressing surface for the press.

Irrespective of whether a steam permeable or hot head press plate is used, the nature of the press plate surface is of great importance in determining the character of pressing. It is generally desirable to have a roughened surface on the press plate, this being true whether the press plate is steam permeable or impermeable. The roughness on the press plate surface should be of such nature as to tend to provide an irregular denting and upstriking action upon the fabric and thus avoid the creation of a smooth shiny surface on the work.

Roughened surfaces for garment press plates have been provided by initial sand blasting of a metal plate of aluminum. Monel metal, stainless steel, or other similar material unaffected by water or steam, followed by metallizing or coating with finely divided particles of aluminum or any other sprayable metal. Such metallized press plates are satisfactory but require care in the manufacture to insure proper adherence of the metallized layer.

In the case of sand blasted metal plates, the nature of the sand blast may cause some undesirable characteristics. The sand particles are quite heavy and additionally quite blunt. A powerful sand blast has an undesirable effect upon the metal of the plate in that the metal is peaned and stretched and may result in warping. This is particularly true if the press plate is of aluminum.

A relatively gentle sand blast results in the formation of craters in the surface of the metal. These craters provide an adherent surface for metallic particles, which metallic surface is generally satisfactory but does exhibit a peeling tendency. In sand blasting generally, some metal is usually removed from the work.

In addition to depressions or concavities extending inwardly from the surface of the metal as is true with conventional sand blasting, this invention makes possible a press plate wherein the surface of the plate is deformed or upstruck to provide minute portions projecting outwardly from the metal. While the projections thus formed are minute, a large number of such projections are formed on a unit area of plate metal surface. The invention provides a plate having material displaced at the plate surface rather than a dented surface which results from sand blasing. The invention may be applied to press plates of metal or plastic or other suitable material.

An advantage incident to the use of the invention lies in the fact that a new desired surface can be obtained with a reduced possibility (as against other methods) of damaging the material from which it is made, during the process of manufacture. An additional advantage resides in the fact that the degree of roughness of the finished press plate may be controlled over a wide range. A further advantage resides in the highly improved adherence characteristics for metallizing. Metallizing such a roughened upstruck surface tends to control the roughness and provides an irregular surface having some outwardly projecting portions.

The invention in general utilizes small irregularly shaped sharp edged particles of light but hard material as projectiles for operating upon the surface of a smooth press plate blank. The press plate blank is preferably of aluminum but may be of plastic or other metals as previously listed. The particles used as projectiles may be, for example, crushed and screened grit particles of blast furnace slag. These slag particles have a low specific gravity as compared to sand, for example, are irregularly shaped, are hard and have good cutting edges. Other particles of comparable lightness provided with cutting edges may be used.

For carrying out the invention, an air blast containing suitable slag particles is directed at a press plate blank. Preferably the slag particle blast is directed at the metal surface at an acute angle to such surface rather than normal thereto. This permits more efficient use of the slag particles in producing the rough surface. The slag particles may be directed normal to the work surface. As will be more fully disclosed, the blast of slag particles is created under controlled pressure ranges and generally close to the work. Instead of an air blast, other means for obtaining a blast of slag particles may be used.

The resulting roughened press plate, which may be perforated or not, as desired, may be used as a finished pressing surface or may be further treated as by metallizing, i.e., spraying or otherwise applying particulate or globular metal, ceramic, plastic or any other suitable, heat and corrosion resistant material. The metallizing consists of subjecting the roughened surface to a blast of metal particles from a spray gun. These metal particles may be of aluminum or any other metal which may be handled by spray guns, it being understood that the spray gun melts the metal and the resulting air blast atomizes the molten metal to form fine metal particles which are directed against the press plate blank. The metallizing results in the formation of a coating of fine metal particles, these metal particles cooperating with the previously roughened upstruck surface to provide a composite surface having highly desirable pressing characteristics.

When a plate is perforated, the perforations are large in comparison to the size of the atomized metal particles used in metallizing. Thus, as an example, apertures of between about .020" and .030" may be used. The density of apertures may range for example, from about 100 to as many as about 600 apertures per square inch of plate. When such a plate is subjected to a slag particle blast, there is a tendency to enlarge the ends of the apertures. On metallizing, a layer metal of from about .003" to as much as about .006" is applied. There is negligible tendency to block perforations. However, the apertures do contain some metallized particles and eliminate any sharp outlines of apertures. This substantially eliminates moire.

For a better understanding of the invention, reference will now be made to the drawing wherein the various figures illustrate means and methods for obtaining press plates embodying the present invention. It is understood that variations may be made without departing from the scope of the invention except as defined by the appended claims.

In the drawing,

Figure 1 is a diagrammatic view illustrating blasting a plate with slag particles to produce an upstruck surface.

Fig. 2 is a plan view of a part of a plate whose surface has been upstruck in accordance with this invention.

Figs. 3 and 3A are magnified sectional views illustrating upstruck plate portions at two different angles of attack.

Fig. 4 is a diagrammatic view illustrating the metallization of an upstruck press plate surface.

Fig. 5 is a plan view of a press plate with an upstruck surface embodying the present invention.

Fig. 6 is a sectional view of a portion of a perforated press plate, part of the plate being metallized.

Fig. 7 is a sectional view generally similar to Fig. 6 except that the plate is not perforated.

Referring to Fig. 1, plate 10 of aluminum, stainless steel, plastic, or the like, comprises a blank for a garment press plate. This blank may have any desired shape and when made into a press plate preferably has an elongated shape with rounded ends characteristic of garment press plates. Blank 10 may have its edges turned up to provide a flange; and springs or other attaching means for attachment of the press plate to the head of a garment press may be attached to the flange. Press plate blank 10 may be either solid or have apertures or perforations therethrough. The plate, when designed to be used as a separable element from the press head, is generally thin, of the order of about 20 gauge, although lighter or heavier material may be used. Whatever apertures may be provided through the press plate are usually small in diameter, such as, for example, from about .020" to about .032" in diameter. The density of the apertures may vary and may range from about 100 per square inch of surface to as much as 600 per square inch of surface.

Press plate blank 10 is subjected to a blast from spray gun 15 fed by compressed air and by slag or grit particles from magazine 16. The slag particles are preferably screened so that particles no larger than a predetermined size will be present. As a rule, the slag particles used for making a garment press plate may be about as large as the head of a common pin used in sewing and dressmaking. Gun 15 is provided with a suitable discharge nozzle of material which is harder than slag particles. As an example, the discharge nozzle may be of tungsten carbide or any other material of comparable hardness. Otherwise the gun and magazine may resemble conventional sand blast guns. Any other means may be used which will cause particles to strike the surface with sufficient force to undercut the same,

create an "upstruck" surface condition, and cause flow of material.

The air pressure used in generating the blast is adjusted so that a desired effect upon the surface of metal blank 10 is provided. Thus, in the case of an aluminum blank, an air pressure of the order of about from 50 to about 100 lbs. per square inch may be used, the work being located between about 3" and about 8" from the tip of the gun. A preferred distance is between about 4" and about 6". An air pressure of the order of between about 50 and 60 lbs. p.s.i. is preferred. As has been previously indicated, it is preferred to direct the blast at an acute angle to the work. The angle may vary and may be, for example, between about 30 degrees and about 45 degrees to the work surface. It is found that by aiming the gun at an angle to the work, the reflection or ricochet of the slag particles will throw them out of the way of the oncoming slag particles, thus rendering the entire blast more effective and more efficient.

As is true in sand blasting and metal spraying, it is necessary to play the gun over the work and avoid excessive blasting at any one region. Due to the fact that the slag particles are light, the energy of each slag particle at the time it strikes the surface of the press plate is low in comparison to the energy of sand particles. Consequently, the slag particles will not cut too deeply into the surface. The shape of the slag particles and the presence of many sharp edges provide for the formation of relatively shallow troughs and upstruck portions in the material adjacent the troughs. Since the particles are irregular, the resulting upstruck portions of the blank will also be irregular.

Referring to Figs. 2 and 3 of the drawing, it will be noted that slag particles 20 deform the surface of plate 10 by displacing the material to form hollows 21 and peaks 22. The hollows and peaks are characterized by jagged outlines and are free from the rounded craters characteristic of sand blasting. It is understood, of course, that hollows 21 and peaks 22 are shown greatly magnified and in practice the dimensions are small. These peaks 22 may have a height of the order of about .001". The density of the hollows and peaks is great enough so that the plate surface appears to be generally uniformly rough to the eye and to the touch.

In Figure 3, the slag particles come from the direction indicated by the arrow at about an angle of 45°. As the angle of attack varies, the outline will vary. In Figure 3A, the angle of attack is about 90°, the peaks extending straight up generally. This surface, without metallizing, makes an excellent pressing surface.

As previously indicated, the upstruck surface shown in magnificd form in Figs. 2 and 3 may be thereafter metallized. Thus referring to Fig. 4, spray gun 26 is adapted to direct a stream of atomized molten metal at the work containing the upstruck surface. Inasmuch as spray guns and metallizing technique are well known, no detailed description thereof is deemed to be necessary. In general, however, aluminum may be used, although other metals may also be used. The size of the metal particles and the thickness of the coating are such that the roughened surface shown in detail in Figs. 2 and 3 still retains its roughness after metallizing. The resulting metallized surface has both hollows and upstanding peaks such as illustrated in Figs. 6 and 7, even though the surface is covered with a layer of sprayed metal.

Referring to Fig. 5, a press plate 30 is illustrated, this press plate being of upstruck material whose surface may be metallized or not, as desired. Plate 30 has the generally oval shape characteristic of press plates and may be provided with accessories, such as springs and the like, for ready attachment to a garment press head. The rim of the press plate may be reinforced to provide a strong construction.

Referring to Fig. 6, there is shown an enlarged detail of the press plate of Fig. 5, this detail illustrating

the plate as being perforated at 31 to pass steam therethrough. Part of the outer surface of press plate 30 is shown as being upstruck and metallized and part is shown as being simply upstruck. The top ends of perforations 31 are flared somewhat by the slag blast. However, the upstruck portions of the metal at the apertures plus the metallizing tend to provide an irregular finish to the terminal portions of the apertures. It is understood in general that the entire plate is either metallized or not metallized and the showing of both metallization and non-metallization is for convenience in illustration. The thickness of the press plate, diameter of aperture and density of aperture through the press plate have been previously set forth. The press plate of the perforated variety as illustrated in Fig. 6 may, if desired, be associated with a suitable steam distributing member.

Referring to Fig. 7, the detail of the press plate 30' is similar to Fig. 6 except that the press plate is solid and not steam permeable. A press plate of this type, as has been previously pointed out, may be used in connection with a hot head type of press.

While a plate having upstruck portions, such as illustrated here and resulting from a bombardment of slag particles, is particularly useful as a press plate for a garment press machine, other uses for such a plate may occur to those skilled in the art. A perforated or non-perforated plate having an upstruck surface may be used where a rough surface is desirable or essential.

Where acute angles less than 90° are specified, it is understood that the complementary obtuse angles of 180° less the specified acute angles are included. Since there is no orientation of the upstruck surface, it is clear that 45°, as an example, and 135° are equivalent.

I claim:

1. In a press plate for assembly with a fabric and garment pressing mechanism and for engaging and pressing fabric work pieces having a rough or non-glossy texture or appearance; a plate of cold workable, substantially rigid yet flowable material configurated to conform to the shape of the portion of the pressing mechanism to which it is to be attached, said plate having an inner surface to be disposed adjacent to the portion of the pressing mechanism on which it is to be mounted, and an outer pressing surface, the outer pressing surface of said plate being roughened by having disposed thereon and therein irregularly distributed hollows and upstanding peaks of irregular configuration formed of the material of the plate and integral therewith, said upstanding peaks being formed of material which is upstruck and displaced from the hollows and being sufficiently tall and numerous to cause said pressing surface of said plate to be rough to the touch, further said upstanding peaks having a sharp jagged structure.

2. In a press plate as set forth in claim 1, said plate of cold workable, substantially rigid, yet flowable material being formed of aluminum.

3. In a press plate as set forth in claim 2, a sprayed layer of particulate aluminum covering and adhered to said outer pressing surface of said plate of cold workable, substantially rigid, yet flowable material.

4. In a press plate as set forth in claim 1, a sprayed layer of particulate aluminum covering and adhered to said outer pressing surface of said plate of cold workable, substantially rigid, yet flowable material.

References Cited in the file of this patent

UNITED STATES PATENTS

1,531,275	Culp	Mar. 31, 1925
2,276,594	Rowell	Mar. 17, 1942
2,314,902	Shepard	Mar. 30, 1943
2,414,923	Batcheller	Jan. 28, 1947
2,632,968	Ray	Mar. 31, 1953
2,743,541	Schultz	May 1, 1956