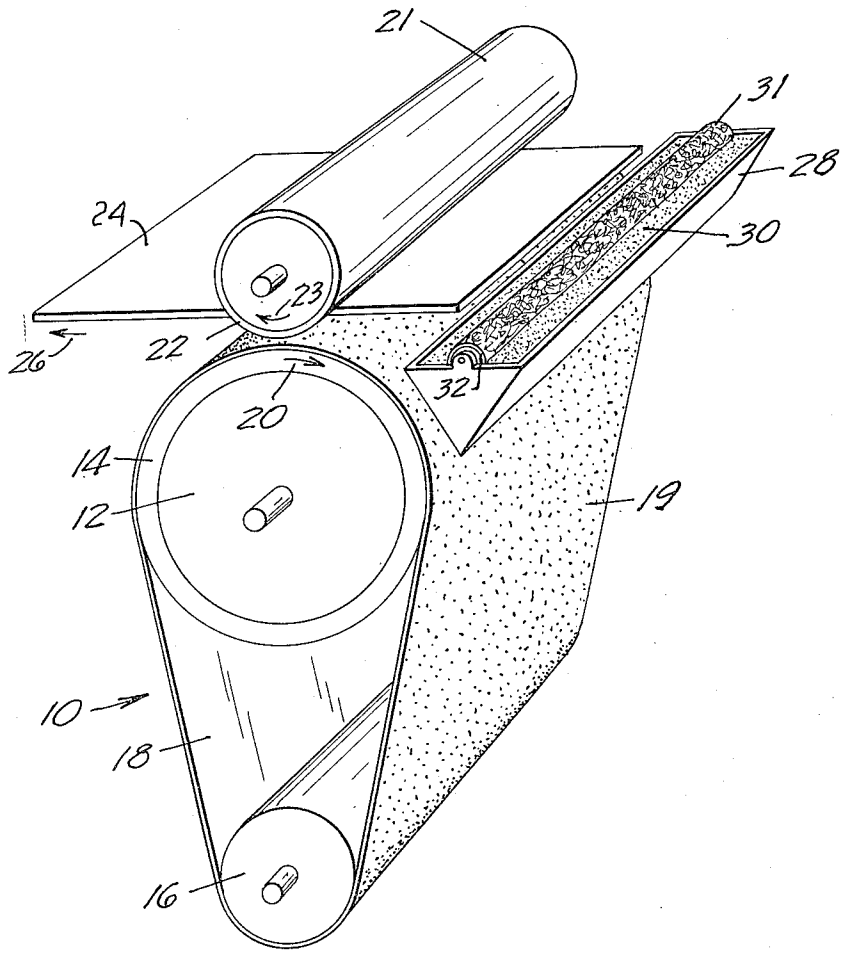
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METHOD OF FINISHING WOOD SURFACES

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METHOD OF FINISHING WOOD SURFACES

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This invention relates to novel techniques for burnishing wood and more particularly to methods of imparting uniform luster to relatively smooth wood surfaces without regard to minor surface imperfections. The invention is especially concerned with the burnishing of wood surfaces which are substantially flat in at least one direction.

Wood surfaces are customarily prepared for protective and beautifying coatings by subjecting them to a series of abrading operations, the last of which is performed with a relatively fine abrasive, e. g., at 4/0 grit. Although the finish imparted by a 4/0 abrasive sheet is relatively smooth, the surface is left with a fuzz consisting of large numbers of nibs or projecting wood fibers. Further sanding with finer abrasives reduces the size and number of nibs and may appear to eliminate them entirely, but if the wood is then provided with transparent finishing coatings without regard to the nibs, the surface will lack the luster which characterizes quality finishes.

Storage of unfinished articles, particularly under conditions of high heat and humidity, results in a gradual emergence of nibs from the surface; and for this reason, it is fruitless to attempt to eliminate the nibs until immediately prior to coating with a finishing material, at which time the wood is scuff sanded, i. e., sanded lightly by hand, to minimize the nibs. Since the sealer or wash coat raises fibers to a considerable extent, the wood is again scuff sanded prior to the application of the second coat.

It is well known that nibs on the surface of unfinished wood may be eliminated by burnishing, that is, by rubbing the wood surface with sufficient vigor to generate substantial heat at the surface while controlling the heating to guard against scorching. Because burnishing techniques heretofore practiced in the wood finishing industry invariably render a surface non-uniform in its acceptance of finishing materials, a mottled effect is obtained upon application of finishing coatings, particularly when the wood is stained. Difficulties in obtaining satisfactory finishes are aggravated if the surface is uneven, i. e., contains high and low spots.

I have now contrived a novel method for burnishing wood whereby substantially uniform porosity, sheen, and smoothness is achieved. Briefly, my technique involves buffing relatively smooth wood surfaces with a durable, cushioned, heat resistant, burnishing sheet faced with small, closely spaced resilient particles while maintaining light and uniform pressure between the said sheet and the wood surface to generate the same temperature at all points on the wood surface. Uniform pressure is realized in spite of uneveness in contour by providing the burnishing sheet with a resilient backing or mounting and in spite of minute surface irregularities by virtue of the resiliency of the individual particles, whereby the particles readily throw into pits and yield to protuberances.

It should be pointed out that resiliency as employed in this description is meant to imply compressibility and flexibility such as possessed by particles of cork or vulcanized rubber. Burnishing materials particularly preferred in the practice of this invention consist of flexible sheets to which are adherently bonded small, closely spaced particles of cork or rubber. However, the particles may be an integral part of the backing in the form of minute projections of a resilient, scabrous sheet.

The figure in the drawing is a perspective view of the device for performing the herein disclosed method.

A variety of commercially available machines are useful in the practice of this invention. Particularly suitable is a belt-drum sander such as is illustrated in the attached isometric drawing, being indicated therein generally by reference character **10**. The belt-drum sander includes a large contact drum **12** which is provided with a resilient backing **14** of rubber vulcanized directly to its surface. Mounted on contact drum **12** and an adjustable idler **16** is a burnishing belt **18** with its particle-bearing face **19** turned outwards. The contact drum **12** is driven by a motor (not shown) to move the burnishing belt **18** at high rates of speed in the direction indicated by the arrow **20**. Mounted above and with its axis parallel to that of contact drum **12** is a feed roll **21** which is faced with a frictioning layer **22** and is driven by a motor (not shown) to rotate at a relatively slow rate in the direction indicated by arrow **23**. The feed roll **21** is adjustable in a vertical plane to provide a desired clearance from the face **19** of burnishing belt **18** to grip a wood panel **24** or other object to be burnished at a desired firmness and thereby compress moderately the particles of burnishing belt **18**. When wood panel **24** is inserted between feed roll **21** and burnishing belt **18**, it is driven in a direction **26** by feed roll **21** by virtue of the substantially greater coefficient of friction of its frictioning layer **22** as compared to that of burnishing belt **18**.

The belt-drum sander illustrated in the drawing is provided with a trough **28** containing a soft, dry powder **30** such as barium sulfate or zinc stearate which is carried to the panel **24** by means of a rotatable cylinder **31** faced with pile material **32**. A layer of powder clings to the underside of the wood panel **24** and is carried to the contact line between the panel **24** and the belt **18**, at which line the powder collects to act as a lubricant, thereby reducing the heat of friction. The powder also serves to minimize dust, and for this purpose a relatively heavy powder is preferred.

A belt-drum sander as illustrated in the attached drawing was used to finish a mahogany panel, which panel had been previously sanded by 1/0 grit abrasive sheet material followed by a 4/0 abrasive sheet. The burnishing belt consisted of a flexible cloth backing having a uniform layer of cork particles adherently bonded thereto, which particles had been screened to about 24–36 mesh size. The particles were overcoated with a thin layer of "air-float tripoli," a finely divided silica-powder. Vulcanized to the contact drum was a one-inch layer of rubber of approximately 30 durometer.

With the cork belt travelling at a surface speed of 4000 feet per minute and the feed roll rotating at a feed speed of approximately 60 feet per minute, a single pass through the machine imparted a smooth, glossy, uniform finish to the mahogany without the use of a lubricant. A second identical mahogany panel was burnished in the same manner except in the presence of zinc stearate powder. The two panels could not be distinguished visually, but the panel finished with the zinc stearate was thought to be somewhat more sleek to the feel. Either surface reflected about one hundred percent more light than it did before being burnished as measured with a reflectometer with light directed at an angle of sixty degrees to the surface of the panel.

Oak and birch panels were finished both with and without the zinc stearate by the same procedure as used

for the mahogany panels. In each case a lustrous finish was imparted to the panel, which finish could be immediately varnished or given some other finishing coat without need for a wash coat. A single coat of varnish yielded a finish of excellent appearance.

It was found that the burnishing closed the pores of the wood to a substantial extent. Since soft areas were more receptive to burnishing than harder areas, the burnished surface was more uniform in its acceptance of finishing materials than surfaces which were not burnished. The closing of the pores renders wood panels less absorptive of moisture and substantially reduces their tendency to warp, both before and after application of finishing coatings. When articles burnished in the practice of this invention are stored without benefit of coatings, the burnished surfaces remain substantially unchanged indefinitely, even though stored under conditions of high heat and humidity.

A variety of other woods such as hemlock, walnut, gum and pine have also been satisfactorily burnished in the practice of this invention. In fact, it is believed that my invention may be applied with good results to the burnishing of any wood including fiberboard.

While a dry lubricant such as zinc stearate is normally not required when burnishing with cork-faced belts as described above except when the belt is new and somewhat stiff, other less-resilient burnishing materials may generate enough heat to scorch the wood when used in the absence of lubricant. A lubricant, in lowering frictional forces, lessens the amount of generated heat to an extent sufficient to guard against combustion. Any powder having a hardness of about one as measured by the Moh scale of hardness is suitable for this purpose as long as it does not affect the finishing coatings deleteriously. Among other powders which have proved to be useful in the practice of this invention are talc and barium sulfate.

A variety of machines designed for abrading operations are adaptable for use in the practice of this invention. In each case, provision must be made for cushioning the burnishing sheet. Among such machines are the stroke sander, which would be used with a resilient pad; the drum sander, the drum of which would be covered with a resilient pad; the disc sander having a resilient pad between polishing sheet and the disc backing; and a flap wheel, which is inherently cushioned by virtue of the flexibility of the flaps, the layers of air between adjacent flaps, and centrifugal forces. While each machine must be so used that each point on the surface of the wood article is held in contact with the burnishing sheet for a time sufficient to heat that point substantially but short of the time at which scorching is encountered, it is well within the ability of the skilled operator to do so.

However, it is unnecessary to guard against burnishing the same area several times within a relatively short period in that the surface layer cools rapidly because the heat penetrates only an ultra-thin layer of wood.

While my invention is primarily concerned with the burnishing of wood surfaces to which no finishing materials have been applied, it is not confined to such use. For example, to a panel having considerable fuzz or nibs was applied a wash coat, resulting in a dull finish, quite rough to the touch. Upon burnishing with a cork-faced belt, the surface of the wash coat was smoothed to a luster, and the nibs were permanently embedded. This technique has considerable commercial significance in the production of wall panelling, which is normally prefinished at the factory with sealer and wax.

My invention has great potential in the finishing of wood floors since the controlled burnishing closes the pores of the wood to dirt. When the surface coating is worn away, the wood continues to repel dirt to a considerable extent, effecting a substantial increase in the period within which the floor must be refinished to preserve its beauty.

Variations in the burnishing sheet including the use of non-particulate facings which act in a manner similar to the burnishing sheets herein described will doubtless occur to those skilled in the art.

What I claim is as follows, including such range of equivalents as the nature of the invention and prior art permits:

1. The method of providing a substantially flat, nib-possessing wood surface with a glossy and relatively non-porous finish comprising buffing the surface under light and uniform pressure with a durable, resiliently-backed, heat-resistant sheet faced with small closely spaced resilient particles for a time sufficient to embed the nibs into said surface without scorching the wood.

2. The method of imparting a uniform luster to a substantially flat, nib-possessing wood surface consisting essentially of the steps of (1) applying a soft dry lubricant to said surface and (2) buffing the surface with a durable, resiliently-backed heat-resistant sheet faced with small, closely spaced resilient particles under light uniform pressure and for a time sufficient to embed the nibs into said surface without scorching the wood.

3. The method of providing a substantially flat, relatively smooth, nib-possessing wood surface with a glossy and relatively non-porous finish comprising buffing the surface with the face of a burnishing sheet under light uniform pressure and for a time sufficient to embed the nibs beneath the said surface without scorching the wood, the polishing sheet having a uniformly distributed layer of cork particles adherently bonded to its face.

No references cited.