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POLISHING OF GLASS-surfaces.

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This invention concerns a method whereby the operations of grinding and polishing glass surfaces, particularly plate glass surfaces, may be completed substantially more rapidly than hitherto.

Hitherto these operations have usually been effected by means of two tools of which the first is commonly a grinding tool made of cast iron. This tool first carries out the coarse grinding, employing coarse-grain sharp grinding means such as sand, and then the fine grinding with the assistance of a grinding agent which is as fine as possible, that is sand-sludge and emery-sludge, which are applied one after the other. After the completion of the grinding the polishing is performed with a second tool consisting of resilient material such as wood, pitch, leather, felt, cloth and the like, said tool rubbing the polishing agent, particularly red iron oxide (polishing red), on the glass surface operated upon until the requisite high degree of brilliance is obtained. In this polishing operation it is to be noted that from the outset a material is selected as the polishing agent which is employed with the same tool to the end. For if an attempt was made to divide the operation of polishing on the one apparatus into several parts or phases, in a similar manner as in the coarse and fine grinding, so as to effect a preliminary polishing with a differently constituted sharper agent and then a brilliant-polishing with the usual final polishing agent it would be essential for the polishing felt or the like to be rinsed out each time in order to remove absolutely completely the sharper particles of the said intermediate agent. Economically this would be impracticable since this cleaning would be attended by a considerable loss of time and would have to be performed with very great care, so that the time occupied by the polishing process would be increased to a disproportionate extent. For this reason it was hitherto necessary to perform the entire polishing operation, that is the preliminary and final brilliant polishing, with a single polishing agent and without interruption. Consequently a polishing agent had to be employed of which the products of disintegration, as in the case of polishing red, cannot cause any scratching of the glass surface. This had the disadvantage, however, that a very slow change only from the fine grinding to the final polishing could be obtained so that the polishing occupied a very long time. For example, the coarse and fine grinding with the assistance of different grinding agents applied successively occupied in a particular instance 18 minutes only whereas the preliminary and final polishing by means of polishing red took 90 minutes. The entire operation of grinding and polishing occupied therefore a total period of 108 minutes.

The present invention which enables the total time for the grinding and polishing to be reduced to about a half consists in subjecting the glass surfaces to be treated, after the fine grinding, first to a preliminary polishing by separate polishing tools, fine sludge material being employed, and only then to a final brilliant polishing by means of other polishing tools employing, for example, polishing red. The difference from the known methods resides therefore in the interpolation of a separate polishing operation, that is a preliminary polishing operation with separate polishing tools. A soft material such as felt, wood, pitch, leather, cloth, or the like is again employed as a polishing tool and a very fine sludge material as the polishing agent. The latter may for instance consist of a fine sand or emery residue of which the grains are so small that it is no longer possible to employ it in grinding because direct contact between the metal grinding tool and the glass surface might occur. Such fine grinding material is nevertheless extremely well adapted for use in the preliminary polishing with soft polishing tools and when employed the time occupied by the entire polishing operation is considerably shortened. The preliminary polishing is effected in a considerably more energetic manner than is the case with polishing red which is a very weak polishing agent and is, generally speaking, particularly suitable for the final brilliant polishing only. After the preliminary polishing has been effected according to the method of the present invention the final brilliant polish is therefore obtained with the aid of polishing red. The same polishing tool is, however, not employed but, as in coarse and fine grinding, the final brilliant polishing is effected with the aid of other soft polishing tools. In this manner a further considerable economy in time is achieved because it is unnecessary to wash out the polishing tool carefully between the operation.
It has been proved that the preliminary polishing may, according to the method of the present invention, be performed in 7 minutes and the subsequent final brilliant polishing in 30 minutes. The entire polishing operation therefore occupies 37 minutes only. If the time for the coarse and fine grinding, 18 minutes, is added thereto, a total period of operation of 55 minutes results which, compared with the 108 minutes of the previous method, represents a reduction to about one half.

The method of the present invention may also be applied to the continuous grinding and polishing process, recently adopted in the plate glass industry, wherein the glass is fed forward on tables forming a continuous band under a plurality of grinding tools each of which operates with a differently grained sand or sludge and is then treated in a similar manner by polishing tools employing polishing red. In this case also, there is the disadvantage that after the grained material operated upon by the final metallic grinding tool, soft polishing red operated upon by a polishing felt is immediately applied.

Consequently the present method may again be employed with success. After the final fine grinding in the progress of the glass on the tables forming a continuous band a fine sand or emery sludge, such that it can no longer be employed with metallic grinding tools, is employed as a polishing agent. If the first polishing tools consist of suitable resilient material an efficient preliminary polishing of the glass surface is effected so that the final felt tool may then fulfill its original purpose, namely, to impart to the glass a polish with a high degree of brilliance in the minimum time. In this case, apart from the reduction in the total period of the operation, the length of the tables may be materially reduced in consequence of the reduction in the number of polishing tools so that the machine as a whole occupies considerably less space, is more easy to construct and requires an expenditure of less power.

I claim:

The method of treating glass surfaces, which consists in grinding and smoothing said surfaces, then subjecting them to a preliminary polishing operation performed with softer tools and abrasive materials used for grinding and smoothing, said materials having first been reduced by the grinding and smoothing operations to a degree of fineness in which they can no longer be applied by hard grinding tools, and finally giving the final polish to said surfaces.

In testimony whereof I affix my signature.

JOSEF PIVIN.