

Feb. 21, 1950

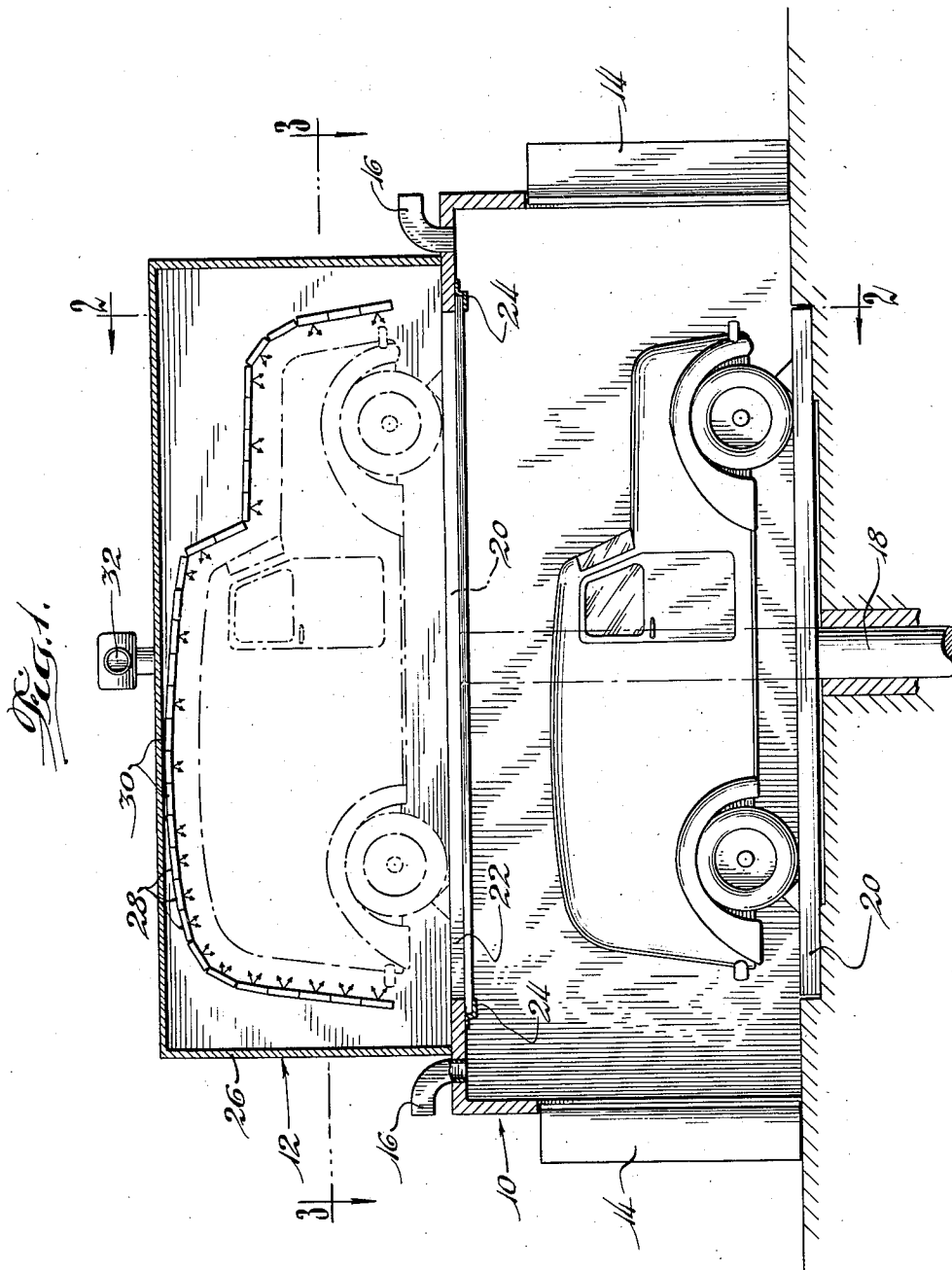
W. J. MISKELLA

2,498,339

COMBINATION PAINT BOOTH AND BAKING OVEN

Filed Sept. 11, 1947

2 Sheets-Sheet 1



INVENTOR.

William J. Miskella

BY

Kinkle, Horton, Cheburg, Hansmann & Wepper
Attorneys

Feb. 21, 1950

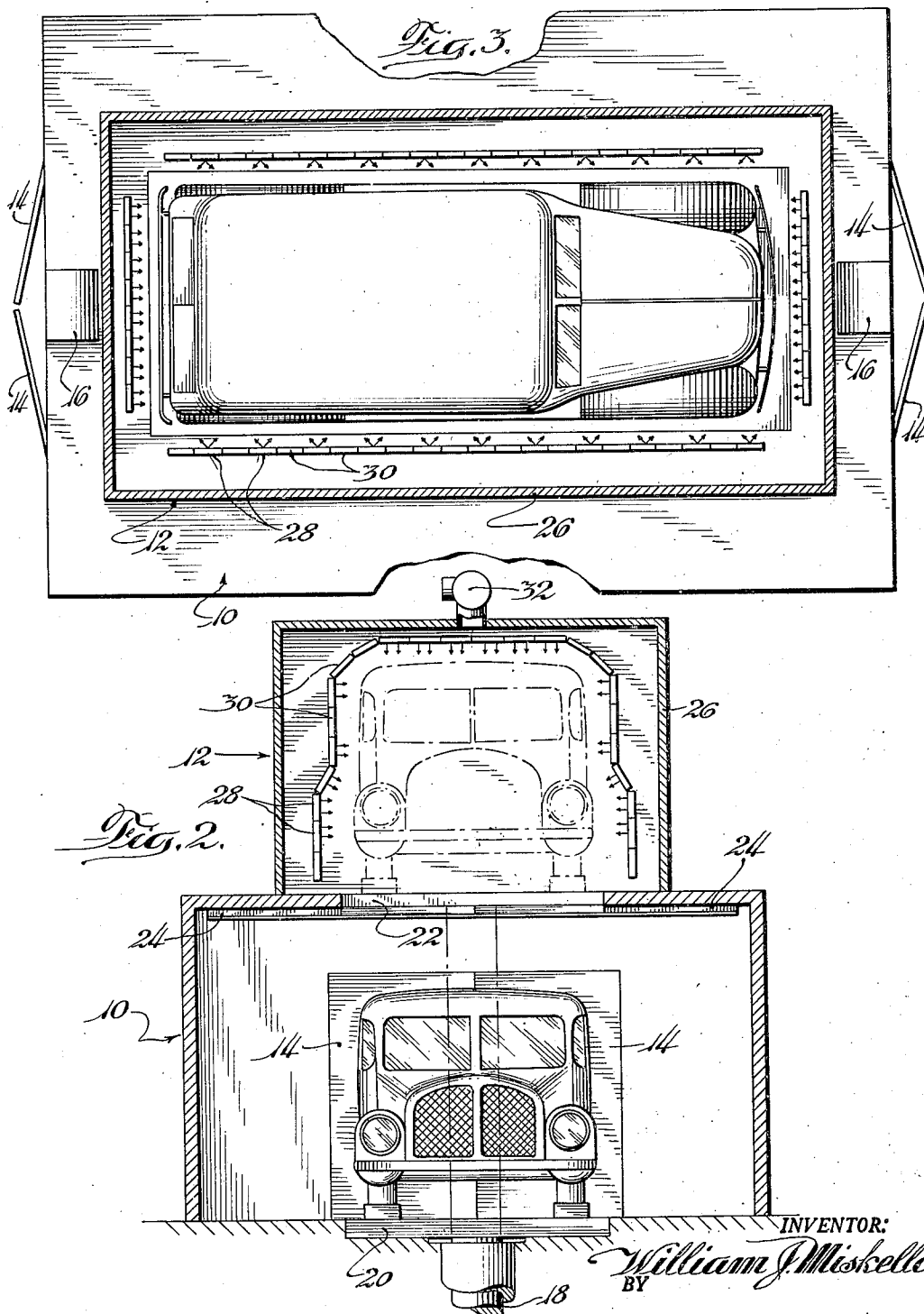
W. J. MISKELLA

2,498,339

COMBINATION PAINT BOOTH AND BAKING OVEN

Filed Sept. 11, 1947

2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE

2,498,339

COMBINATION PAINT BOOTH AND BAKING OVEN

William J. Miskella, Cleveland, Ohio

Application September 11, 1947, Serial No. 773,374

3 Claims. (Cl. 91—55)

1

My invention relates to an apparatus for re-finishing automobiles.

In the factory finishing of automobiles, the method usually employed is to spray the automobile in a paint booth, move it into an infrared baking tunnel open at both ends and there bake the enamel as the body moves forward on a conveyor. There are objections to this procedure. The consumption of floor space is high and the baking process is relatively inefficient due to the fact that there are no lamps bearing closely on the front and rear ends of the automobile, and to secure proper baking at these points the time of operation for the whole unit must be substantially extended and the average temperature is higher than necessary.

These factors, when applied to the refinishing of automobiles, put baking facilities beyond the means of all but a few garages and would-be users, and in fact has made true baking with prior equipment impossible because of the difficulty of obtaining a temperature of 175 degrees F. all over the surface without overheating upholstery material, glass and other automobile equipment which, of course, is not present during the original finishing of the body shell. Because of the presence of this equipment, refinishing temperatures should not be above 200 degrees F. Refinishers are hence generally limited to air-dry laquers. A few baking ovens are known in the refinishing field but because of the inefficiencies and difficulties pointed out above, the power consumption is high and the temperatures are uneven and too low to be of substantial benefit and fall far short of the desirable 175 to 200 degree F. range. High grade baking enamels therefore cannot be used.

There are other objections inherent in the procedure presently followed. The separate paint booth and oven permit simultaneous baking and painting which, unless the units be far separated, is a serious fire hazard. Furthermore, moving the vehicle from the booth to the oven is generally done by the vehicle engine which further adds to the danger of fire.

My invention overcomes all of these objections. The floor space occupied amounts to no more than that used by the paint booth alone. The painting may be done in a booth affording adequate clearance on both top and sides for the painter while the baking may be done with the lamps close enough to the finish to operate at high efficiency, subject only to variances in automobile sizes and body styles. The front and rear of the car receives as much heat as do the sides and

2

top. Because of the high efficiency of the apparatus true baking temperature can be easily achieved with a minimum of power consumption. The fire hazard is greatly reduced since, first, the nature of the apparatus prohibits simultaneous spraying and baking, and second, automotive power is not required for moving the automobile between the paint booth and the oven and hence the gasoline may be drained from its tank before the refinishing operation is begun.

One of the objectives of the present invention is, therefore, to provide an oven wherein automobile finishes may be uniformly baked by subjecting all painted surfaces to an approximately uniform degree of heat.

Another object of my invention is to provide an oven for baking automobile finishes wherein the fire hazards are greatly diminished.

Still another object of my invention is to provide a combination paint booth and oven which occupies a minimum of floor space.

Yet another object is to provide a combination paint booth and oven for baking automobile finishes which offers adequate space for spraying and yet which permits the heating means to bake the finish at its most efficient distance.

Another object is to provide a combination paint booth and baking oven in which an automobile may be moved from the booth to the oven without danger either of fire or injury to the wet painted surface.

Another object is to provide an improved baking oven for refinishing automobiles which is less expensive to construct and less expensive to operate than those previously known and yet which achieves high temperatures and superior results due to high efficiency.

Other objects and advantages will become apparent from the following description of a preferred embodiment of my invention which is illustrated in the accompanying drawings.

In the drawings:

Fig. 1 is a diagrammatic sectional side view taken substantially as indicated at line 1—1 of Fig. 3;

Fig. 2 is a diagrammatic sectional end view taken substantially as indicated at line 2—2 of Fig. 1; and

Fig. 3 is a diagrammatic sectional top view taken substantially as indicated at line 3—3 of Fig. 1.

The invention consists basically of a paint booth 10 and a baking oven 12. The paint booth 10 may be of any appropriate size suitable to accommodate the largest automobile which it is

contemplated would be refinished and still provide ample working space and overhead clearance for convenient spraying. The booth is equipped with double doors 14 at each end through which the automobile may enter and leave the apparatus. These doors are furnished with panel-type renewable air filters to minimize dust and dirt in the booth. Air is drawn out of the booth through suction ducts 16 to provide ventilation and to draw off paint fumes. Centrally located in the floor of the booth is an air or hydraulic car lift 18 of any suitable type equipped with a platform 20 which is preferably solid. An opening 22 in the ceiling of the booth communicates with the baking oven 12. This opening is of a size to receive closely the platform 20 in such fashion as to form a floor for the oven. The opening may also be closed by a pair of doors 24, here shown as sliding but which may be hinged to drop downwardly or secured in any other fashion to the ceiling of the booth.

The baking oven 12 consists of a rectangular enclosure 26 without openings except for the bottom opening 22 by which it communicates with the paint booth. It is mounted on the top of the booth centrally of the opening 22. The oven is floored by the doors 24 when the unit is being used for spraying purposes and by the platform 20 when the unit is being used for baking purposes. Within the oven enclosure are mounted a number of panels 28 having a reflecting inner surface and crossed infrared lamps. The panels are fully described in my copending application Serial No. 632,058, filed November 30, 1945 and issued as Patent No. 2,478,001, dated August 2, 1949. Other panels 30 providing only a reflecting surface are inserted as needed to prevent too great a concentration of heat in certain localized areas or to limit the overall heat of the oven. It will be noted from the copending application above referred to that the infrared lamps in these panels may be operated at full voltage to obtain a true baking temperature. However, any appropriate heating means such as gas, electricity, or oil may be employed.

These panels may be permanently fixed at such distance from each point of the painted surface of the largest automobile it is contemplated will be handled to deliver the most efficient heating effect, or they may be adjustably fixed in the enclosure to permit adaptation to various sizes and body styles. In the event that the panels are fixedly located, it may be readily seen that they can follow closely the contours of the hood and fenders, the top, sides and ends of the vehicle since variances in these dimensions do not differ greatly from automobile to automobile. However, in the rear horizontal portions of the car, differences may be great, as in the case of a coupé as compared to a panel truck. In the heating system covering this area then, the number of lamps may be increased to provide adequate heat for the body styles having surfaces at greater distances from the lamps. These additional lamps may, of course, be connected to a separate switch to provide the unit with the necessary flexibility and to avoid overheating the panel truck or sedan-type body. It will also be noted from the copending application that these panels are designed to perform structural functions and hence a separate enclosure is not essential for the purpose of the invention.

A suction fan 32 is mounted on the enclosure to carry off the solvent-laden air in the baking process.

In operation, a car is driven upon the platform 20 of the lift 18 in the paint booth 10. Preferably the gasoline tank is then drained to avoid fire hazard. The doors 14 are closed, the suction ducts are set into operation to draw air through the booth, the sliding doors 24 are closed, and the car is then painted. At the conclusion of the painting operation the sliding doors are opened and the automobile is raised into the infrared oven, the platform serving as a floor for the oven. The lamps or other heating means are actuated until the car is baked. At the conclusion of the baking operation the lift is lowered and the car may be pushed or refueled and driven out of the booth.

The fire prevention features of my invention may be readily noted from the above description. Since the transfer between the booth and oven can be accomplished only by the lift, the gasoline may be removed before refinishing without imposing any problems of movement. It will also be noted that the spraying and baking operations cannot be carried on simultaneously. When an automobile is in the baking position on the platform of the lift, the shaft of the lift is extended upwardly centrally of the painting booth, thus effectually blocking its use and hence prohibiting the use of the booth while the automobile is being baked.

Having described my invention, what I claim as new and useful and desire to secure by Letters Patent of the United States is:

1. A combination paint booth and baking oven for refinishing automobiles comprising a paint booth, means defining an opening in the top of said paint booth sufficiently large to permit the passage of an automobile through said opening, an enclosed baking oven surmounting said paint booth and communicating with it by said opening, heating means located in said baking oven, and an automobile lift for transferring an automobile vertically between said oven and said booth, said lift including a movable platform adapted to support an automobile and fitting into and closing said paint booth top opening so as to form a floor for said baking oven when said lift is moved to the position in which an automobile is transferred to said baking oven.

2. A combination paint booth and baking oven for refinishing automobiles comprising a paint booth, means defining an opening in the top of said paint booth sufficiently large to permit the passage of an automobile through said opening, an enclosed baking oven surmounting said paint booth and communicating with it by said opening, said oven including heating means conformed generally to the contour of the painted surface of an automobile thereby to insure approximately even distribution of heat over said surface, and an automobile lift for transferring an automobile vertically between said oven and said booth, said lift including movable means closely fitting into and closing said paint booth top opening when moved to the position in which an automobile is transferred to said baking oven.

3. A combination paint booth and baking oven for refinishing automobiles comprising a paint booth of a size sufficient to enclose an automobile and to afford ample working space about the automobile, means defining an opening in the top of the booth sufficiently large to permit the passage of said automobile therethrough, a baking oven adapted to enclose closely the automobile surmounting said booth and communicating with said booth by said opening, said oven

including heating means conformed generally to the contour of the painted surface of the automobile thereby to insure approximately even distribution of heat over said surface, and means for transferring said automobile vertically between said oven and said booth, said last named means including a movable platform adapted to support the automobile and having a plane area larger than the area covered by the automobile so as to fit closely said top opening in said paint booth and to provide a floor for said baking oven when the automobile is transferred to said baking oven.

WILLIAM J. MISKELLA.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,285,542	Yamashita	Nov. 19, 1918
1,562,762	Harris	Nov. 24, 1925
1,998,615	Groven	Apr. 23, 1935
2,135,765	Paine	Nov. 8, 1938