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My invention relates to an apparatus for refinish- 
ing automobiles.

In the factory finishing of automobiles, the 
method usually employed is to spray the au-
tomobile in a paint booth, move it into an infrared 
baking tunnel open at both ends and then bake 
the enamel as the body moves forward on a con-
veyor. 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 tempera-
ture 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 dif-
culty of obtaining a temperature of 175 degrees 
F. all over the surface without overheating up-
holstery 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, finishing 
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 ineffi-
ciencies and difficulties pointed out above, the 
energy consumption is high and the temperatures 
are uneven and too low to be of substantial ben-
efit 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 sepa-
rated, is a serious fire hazard. Furthermore, 
moving the vehicle from the booth to the oven 
is generally done by the vehicle engine which 
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 paint-
ing 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 
positioned 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 

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top. Because of the high efficiency of the appa-

ratus 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 simul-
taneous spraying and baking, and second, auto-
motive power is not required for moving the au-
tomobile between the paint booth and the oven 
and hence the gasoline may be drained from its 
tank before the finishing operation is begun.

One of the objectives of the present inventor 
is, therefore, to provide an oven wherein au-
tomobile finishes may be uniformly baked by 
subjecting all painted surfaces to an approxi-
mately 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 pro-
vide a combination paint booth and oven which 
occludes a minimum of floor space.

Yet another object is to provide a combination 
paint booth and oven for baking automobile fin-
ishes 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 au-
tomobile 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 bak-
ing oven for refinishing automobiles which is less 
expensive to construct and less expensive to op-
erate than those previously known and yet which 
achieves high temperatures and superior results 
due to high efficiency.

Other objects and advantages will become ap-
parent from the following description of a pre-
ferred 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 air that 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 such 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 forward lamps. The panels are fully described in my copending application Serial No. 632,038, 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 adjustable 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 coupe 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 26 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 refinishings 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 generally adapted to the contour of the painted surface of an automobile, and automobile lift for transferring an automobile vertically between said oven and said booth.

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 generally adapted to the contour of the painted surface of said automobile.
including heating means conformed generally to
the contour of the painted surface of the auto-
mobile thereby to insure approximately even dis-
tribution of heat over said surface, and means
for transferring said automobile vertically be-
tween 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 auto-
mobile 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.

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<tr>
<th>Number</th>
<th>Name</th>
<th>Date</th>
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<td>Yamashita</td>
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