

PATENT SPECIFICATION



Application Date: Nov. 3, 1943. No. 18201/43.

573,545

Complete Specification Left: Oct. 30, 1944.

Complete Specification Accepted: Nov. 26, 1945.

PROVISIONAL SPECIFICATION

Improvements in and relating to Immersion Testing Apparatus

We, ERIC ERNEST SAMUEL WADE, and SYDNEY ALFRED JONES, both British Subjects and of The Lang Pen Company Limited, 13, Hope Street, Liverpool, in the County of Lancaster, do hereby declare the nature of this invention to be as follows:—

10 This invention relates to immersion testing apparatus and more especially to apparatus comprising a series of baths or tanks wherein articles such as tubular heat exchangers are immersed for test purposes during manufacture or assembly.

15 Hitherto in the manufacture and assembly of such articles as the coolant radiators for aircraft engines, the components after brazing or soldering are immersed in a series of baths or tanks usually comprising in succession a sodium carbonate wash for removing the brazing or flux residues, a plain water rinse, a hot liquor bath which may be of glycerine heated to about 130° C. to simulate the temperature stresses likely to be met with when the radiator is in use, followed by a washing-off tank and, finally an air-under-water test tank, and where this series entailing not less than three and more usually five tanks, is arranged in line or otherwise as customary, not only is considerable space required in the assembly or test shop, but also the water, heating, effluent and fume take-off services are complicated and extended accordingly.

25 The present invention has for its object to provide improved and compact forms of immersion testing apparatus for which the required services may be centralised and in which the several baths or tanks may be grouped together as one self-contained unit suited for location where convenient in the shop.

30 Broadly stated, immersion testing apparatus according to the present invention comprises a plurality of baths or tanks each conveniently of general sectorial form, arranged radially around a central cavity in which the water supply, heating and draining or effluent services may be grouped and adapted to be surmounted by a hood or hoods connected to a common take-off for toxic or noxious fumes.

Preferably, the apparatus is constructed

as a self-contained roundhouse mounting the several tanks, an overhead monorail 55 conveyor for transporting the articles to be tested thereover, and a hood equipped with a fume extracting fan, the complete unit being adapted for ready transportation to, and installation at, any convenient site within the shop where the requisite water supply, drain and heating services are available to be linked up with the unit by appropriate branches provided for the purpose within the central cavity 65 thereof.

In a specific embodiment of a self-contained roundhouse having five baths or tanks and suitable for testing coolant radiators for liquid-cooled internal combustion engines such as aircraft engines, a framework or spider is made up of five approximately equal lengths of channel iron, each similarly bent to U or yoke form and connected together so that their 75 limbs point radially outwards while their central portions are vertical and jointly define a circular central cavity. The several yoke shaped members of the frame may be connected by any suitable structural components and a monorail slung 80 from their upper limbs may appropriately serve this purpose.

Suitably mounted on the lower limbs of the yoke frame members are the five 85 generally sectorial tanks, respectively a sodium carbonate tank, a rinsing tank, a hot liquor test tank, a washing-off tank, and an air-under-water test tank with valve control outlets leading from their 90 inner walls and adapted to pass any effluent into a common drain which, as will be understood, would be provided for the purpose below the central cavity of the roundhouse at the site within the shop 95 selected. Also within such central cavity are located the branches for the water supply, gas or oil heating, compressed air or other services entailed by the particular test to which the articles are to be sub- 100 jected, the arrangement being such that these branches may be readily connected to a group supply when the roundhouse is appropriately positioned.

Carried by the top of the structure is a 105 hollow, cone-like hood appropriately of

[Price 1/-]

sheet metal housing an extractor fan for the withdrawal of any fumes which may be present or generated during the testing operation and adapted to be connected with appropriate ducting conveying such fumes to the exterior of the shop.

If desired the overhead monorail may include a turntable, e.g. to facilitate diversion of rejects for repair or attention prior to re-testing and further, to enhance the mobility of the self-contained roundhouse unit which in the embodiment described is some 8 ft. in diameter by 12 ft. high, it may be equipped with

small wheels or castors.

By the present invention, improved compact and efficient forms of immersion testing apparatus are obtained which are readily and cheaply installed and which are convenient and economical in operation.

Dated this 3rd day of November, 1943.
O'DONNELL, LIVSEY & CO.,
Chartered Patent Agents,
3, Lower Common South,
London, S.W.15.
Agents for Applicants.

COMPLETE SPECIFICATION

Improvements in and relating to Immersion Testing Apparatus

We, ERIC ERNEST SAMUEL WADE, and SYDNEY ALFRED JONES, both British Subjects and of The Lang Pen Company Limited, 13, Hope Street, Liverpool, in the County of Lancaster, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to immersion testing apparatus and more especially to apparatus comprising a series of baths or tanks wherein articles such as tubular heat exchangers are immersed for test purposes during manufacture or assembly.

Hitherto in the manufacture and assembly of such articles as the coolant radiators for aircraft engines, the components after brazing or soldering are immersed in a series of baths or tanks usually comprising in succession a sodium carbonate wash for removing the brazing or flux residues, a plain water rinse, a hot liquor bath which may be of glycerine heated to about 130° C. to simulate the temperature stresses likely to be met with when the radiator is in use, followed by a washing-off tank and, finally, an air-under-water test tank, and where this series, entailing not less than three and more usually five tanks, is arranged in line or otherwise as customary, not only is considerable space required in the assembly or test shop, but also the water, heating, effluent and fume take-off services are complicated and extended accordingly.

The present invention has for its object to provide improved and compact forms of immersion testing apparatus for which the required services may be centralised and in which the several baths or tanks may be grouped together as one self-

contained unit suited for location where convenient in the shop.

Broadly stated, immersion-testing apparatus according to the present invention comprises a plurality of baths or tanks, each conveniently of general sectorial form, arranged radially around a central cavity in which the water supply, heating and draining or effluent services may be grouped, and adapted to be surmounted by a hood or hoods connected to a common take-off for toxic or noxious fumes.

Preferably, the apparatus is constructed as a self-contained roundhouse mounting the several tanks, an over-head monorail conveyor for transporting the articles to be tested thereover, and a hood equipped with a fume extracting fan, the complete unit being adapted for ready transportation to, and installation at, any convenient site within the shop where the requisite water supply, drain and heating services are available to be linked up with the unit by appropriate branches provided for the purpose within the central cavity thereof.

In a specific embodiment of a self-contained roundhouse having five baths or tanks and suitable for testing coolant radiators for liquid-cooled internal combustion engines such as aircraft engines, a framework or spider is made up of five approximately equal lengths of H-section or channel iron, each similarly bent to U or yoke form and connected together so that their limbs point radially outwards while their central portions are vertical and jointly define a circular central cavity. The several yoke shaped members of the frame may be connected by suitable structural components and a monorail slung from their upper limbs may appropriately serve this purpose.

This embodiment will be further

described with reference to the accompanying drawings where

Fig. 1 is an elevational view of the roundhouse assembly and

5 Fig. 2 is a plan thereof.

Referring now to the drawings, 1 represents a sodium carbonate bath, 2 a rinsing bath 3 a hot liquor test bath, 4 a washing off bath and 5 an air-under-water test
10 bath, these five baths being in the form of open topped generally sectorial tanks arranged around a central cavity and suitably mounted on the lower limbs 6 of the yoke frame members 7 whose upper limbs
15 8 project radially outwardly over the tanks and carry the over-head monorail 9 from which the articles to be tested—in this case coolant radiators for internal combustion engines—can be suspended
20 and traversed between successive immersions.

Each tank has a valve controlled outlet (not shown) leading from its inner wall and adapted to pass any effluent into a
25 sump 10 having a common drain which as will be understood would be provided for the purpose in the floor or footing below the central cavity of the roundhouse at the site within the shop selected.

30 In the embodiment illustrated the shop floor is formed with an annular dais or raised platform 11 surrounding the sump 10 and providing a dry stand for the operatives working at the roundhouse.

35 15 represents the gas supply branch leading to a gas burner 16 for raising the temperature of the hot liquor test tank 3, 17 is the air line terminating at an air valve or connector 18 for the pneumatic
40 apparatus employed during testing, and 19 is a water main terminating in a water valve or connector 20 conveniently suitable for taking a flexible pipe. As will be understood, the arrangement of these
45 branches is such that they may be readily connected to a group supply when the roundhouse is appropriately positioned.

The gas supply pipe 15 is shown equipped with a ring pipe 21 encircling
50 the central cavity defined by the vertical limbs 7 of the yoke frame members.

Carried by the top of the structure consisting of the five yokes or U-frame members 7 is a cone-like hood 25 appropriately
55 of sheet metal housing an extractor fan 26 for the withdrawal of any gas fumes which may be present or generated during the testing operation, this hood being adapted to be connected with any appropriate ducting or chimney conveying such
60 fumes to the exterior of the shop, and concentrically within the cone shaped hood is a smaller duct or flue 27 extending
65 downwardly to the level of the open tops of the tanks 1—5 and there furnished

with intake branches or openings 28 through which pass any fumes generated during the testing operation or which may be present at the surface of the liquor in the
70 respective tanks.

29 and 30 represent pumps which are furnished for washing out the radiators by flushing when required, and 31 is an electric distributor panel adapted for connection to the mains and supplying current
75 for the fan 26, lighting and it may be for an electric heating system alternative to the gas burner 16, as well as for the thermostats by which temperature control is effected
80

The overhead monorail includes a turntable 32, e.g. to facilitate diversion of rejects for repair or attention prior to re-testing and further, to enhance the
85 mobility of the self-contained roundhouse unit which in the embodiment described is some 3 ft. in diameter by 12 ft. high, it may be equipped with small wheels or castors.

By the present invention improved
90 compact and efficient forms of immersion testing apparatus are obtained which are readily and cheaply installed and which are convenient and economical in operation.
95

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we
100 claim is:—

1. Immersion testing apparatus comprising a plurality of baths or tanks each of general sectorial form, arranged
105 radially around a central cavity in which the water supply, heating and draining or effluent services may be grouped, and adapted to be surmounted by a hood or hoods connected to a common take-off for toxic or noxious fumes.

2. Immersion testing apparatus according
110 to the preceding claim constructed as a self-contained roundhouse mounting the several tanks, an overhead monorail conveyor for transporting the articles to be tested thereover, and a hood equipped
115 with a fume extracting fan, the complete unit being adapted for ready transportation to, and installation at any convenient site within the shop where the requisite water supply, drain and heating services
120 are available to be linked up with the unit by appropriate branches provided for the purpose within the central cavity thereof.

3. Immersion testing apparatus according
125 to either of the preceding claims including five generally sectorial tanks and a framework made up of five yoke or U-shaped members connected together so that their limbs point radially outwards and their central portions are vertical and
130

jointly define a circular central cavity.

4. Immersion testing apparatus according to any of the preceding claims including a cone-like hood of sheet metal, for the
5 withdrawal of fumes which may be present or generated during the testing operation.

5. Immersion testing apparatus according to any of the preceding claims including
10 a central vertical duct with apertures or branch intakes leading radially thereinto from above the respective baths and

furnished with an extractor fan for the purpose specified.

6. Immersion testing apparatus constructed and arranged for use substantially
15 as described with reference to the accompanying drawings.

Dated this 30th day of October, 1944.

O'DONNELL, LIVSEY & CO.,
Chartered Patent Agents,
3, Lower Common South,
London, S.W.15,
Agents for Applicants.

Leamington Spa: Printed for His Majesty's Stationery Office, by the Courier Press.—1945. Published at
The Patent Office, 25, Southampton Buildings, London, W.C.2, from which copies,
price 1s. 0d. each (inland) 1s. 1d. (abroad) may be obtained.

[This Drawing is a reproduction of the Original on a reduced scale.]

