



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<b>(51) International Patent Classification<sup>3</sup> :</b> <b>B28B 1/14; B29C 5/00</b> <b>B29G 7/00; B41M 1/30</b>	<b>A1</b>	<b>(11) International Publication Number: WO 83/ 02918</b> <b>(43) International Publication Date: 1 September 1983 (01.09.83)</b>
<p><b>(21) International Application Number:</b> PCT/AU82/00005</p> <p><b>(22) International Filing Date:</b> 25 February 1982 (25.02.82)</p> <p><b>(71) Applicant (for all designated States except US):</b> COMSERV (No. 53) PTY. Limited [AU/AU]; P.O. Box 1407, Southport, QLD 4215 (AU).</p> <p><b>(72) Inventor; and</b>  <b>(75) Inventor/Applicant (for US only) :</b> ROBERTS, John, William [AU/AU]; P.O. Box 1407, Southport , QLD 4215 (AU).</p> <p><b>(74) Common Representative:</b> COMSERV (No. 53) PTY. LIMITED; P.O. Box 1407, Southport, QLD 4215 (AU).</p> <p><b>(81) Designated States:</b> DE, GB, JP, US.</p> <p><b>Published</b>  <i>With international search report.</i>  <i>With amended claims.</i></p>		
<p><b>(54) Title:</b> THE ROBERTS SYSTEM FOR THE MANUFACTURE OF FIBERGLASS, CULTURED MARBLE &amp; ONYX PRODUCTS</p>		
<p><b>(57) Abstract</b></p> <p>A process for the manufacture of a fiberglass, cultured marble or onyx products which comprises: a) Storing suitable moulds in a heated room at above 30°C; b) Moving the mould to an area where Gelcote is applied using standard equipment; c) Moving the mould to an area for the application of the required patterns to the 'gelcoted' surface by means of silk screens made to a predetermined design; d) Moving the mould to a mixing head area where components of the final products, comprising a resin mixture and catalyst, which are stored separately, are mixed and added to the mould to form the required article; e) The product mould complete with article is then moved to a demoulding and storage area and after allowing for a curing time of about 20 minutes, the article is removed from the mould; f) The mould is then returned to the heated room, in (a) above, to complete the process cycle.</p>		

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<p>(54) Title: THE ROBERTS SYSTEM FOR THE MANUFACTURE OF FIBERGLASS, CULTURED MARBLE &amp; ONYX PRODUCTS</p> <p>(57) Abstract</p> <p>A process for the manufacture of a fiberglass, cultured marble or onyx products which comprises: a) Storing suitable moulds in a heated room at above 30°C; b) Moving the mould to an area where Gelcote is applied using standard equipment; c) Moving the mould to an area for the application of the required patterns to the 'gelcoted' surface by means of silk screens made to a predetermined design; d) Moving the mould to a mixing head area where components of the final products, comprising a resin mixture and catalyst, which are stored separately, are mixed and added to the mould to form the required article; e) The product mould complete with article is then moved to a demoulding and storage area and after allowing for a curing time of about 20 minutes, the article is removed from the mould; f) The mould is then returned to the heated room, in (a) above, to complete the process cycle.</p>		

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HU	Hungary	TG	Togo
JP	Japan	US	United States of America
KP	Democratic People's Republic of Korea		

THE ROBERTS SYSTEM FOR THE MANUFACTURE OF FIBERGLASS,  
CULTURED MARBLE & ONYX PRODUCTS.

DESCRIPTION

A system for the manufacture of fibreglass, cultured marble & onyx products.

TECHNICAL FIELD.

This invention is a system for the manufacture of fibreglass, cultured marble & onyx products for the building, decorative, novelty, leisure & other industries.

Background Art:

Fibreglass, cultured marble & onyx products are well known & extensively used in the building, decorative, novelty, leisure & other industries for many years.

In the building industry, these products include vanity tops & integral basins, wall panels, shower enclosures, baths & many other items.

Production of these items is mainly achieved by mixing a predetermined formula in a conventional dough mixer, then hand pour the formula into buckets or other containers, manually add catalyst & other additives & stir same in these containers, add colouring & veining to provide color & pattern and then hand pour into a preselected mould and left to cure for some 25 minutes. The article is then removed from the mould.

DISCLOSURE:

The invention is a system for the manufacture of fibreglass, cultured marble & onyx products, using mechanical methods for the continuous mixing of the formula, depositing the same to preheated moulds, which in turn have been gelcoted & with pattern & colour applied by means of silk screens. These methods allow for the reduction in curing times used & so attain greater productivity over conventional methods, now in use.

DRAWINGS:

A drawing is enclosed which shows a typical layout of the areas to be used within the system and the movement of the moulds throughout the process.



THE ROBERTS SYSTEM - DESCRIPTION (CONTINUED)BEST MODE FOR CARRYING OUT THE INVENTION:

The following areas are required to attain the best results for the manufacture of fibreglass, cultured marble & onyx products when using The Roberts System & these areas are further defined in the attached drawing:

(A) Heated room for mould storage - suggested constant 30degrees Cent.

(B) Spray area for application of Gelcote to moulds.

(C) Silk screen area for application of the pattern & pigments to mould

(D) -1.

Bulk container-blunderer-dispenser area for the storage and mixing of un-catalysed resin, calcite & pigment in the proportions required by the designated formula.

-2.

This container will be constructed from stainless steel or aluminium outer with stainless steel or aluminium mixing blades to the inner - such blades to be driven by an electric motor. Note, the capacity of the container and the electric motor will be dependant on the storage requirements of the individual manufacturer.

-3.

The formula will be mixed & paddled when the process is non-operational and will be pressurised to approximately 20 lbs/sq.foot.

-4.

P.V.C. or similar feeder lines will be fitted from this container to the mixing head area (e) for application of the formula to the moulds.

(E) Mixing head area for the application of the formula from area (d) with catalyst from area (f), to the moulds.

(F) Catalyst storage container fabricated from stainless steel or aluminium. The capacity of this container will be dependant on the storage requirements of the individual manufacturer.

(G) Demoulding & storage area for finished products.

BEST MODE FOR CARRYING OUT THE INVENTION - Continued.PROCESS:

1. The moulds will be stored in the room area (a) at a constant temperature of approximately 30 degrees Centrigade.
2. The required product mould is then moved to area (b) where the Gelcote is applied, using standard or modified equipment - such as Binks, Bullet, Glasscraft, Robertson or similar types - after presetting such equipment to attain a ten (10) minute gellation.
3. The mould is then moved to area (c) for the application of the coloured pattern to the gelcoted surfaces by the use of silk screens to a predetermined design and by using one or more pigments or other such formula necessary to attain the required design.
4. The mould is then moved to the mixing head area (e) where the formula from the bulk container (d) is mixed with catalyst from area (f) and deposited to the mould, in the preset proportions to attain a three (3) minute gellation time or such other time that may be required for various formulae and or existing atmospheric conditions.  
Again, the mixing & depositing of the formula will be made by use of standard or modified Binks, Bullet, Glasscraft, Robertson or similar types of equipment.
5. The product mould complete with article is then moved to the demoulding and storage area (g) and after allowing for a curing time of approximately twenty (20) minutes, the article can be removed from the mould.
6. The mould is then returned to the heated room (a) and so completing the process cycle.

THE INDUSTRIAL APPLICABILITY OF THE INVENTION:

The invention can be used for the manufacture of all fibreglass, cultured marble and onyx products for use in the building, decorative, novelty, leisure and other industries.

The invention is comparable for modification of the existing systems, currently in use.



CLAIMS.PART ONE:

The invention has adopted the following technical features to manufacture fibreglass, cultured marble & onyx products, in addition to the established prior art and currently being used throughout the industry.

1. Preheating of moulds to approximately 30 degrees Centigrade.
2. Continuous mixing & paddling of un-catalysed resin, calcite & pigments whilst being stored in a stainless steel or aluminium outer container with stainless steel or aluminium mixing blades fitted to the inner - such blades to be driven by an electric motor.
3. Depositing of tinter, pigment or other formula to the mould by the use of predesigned silk screens to achieve uniform colour and pattern to the product article.
4. Mechanical mixing & depositing of paddled formula to mould by using a modified Binks, Bullet, Glasscraft, Robertson or similar type depositor gun. When using this equipment, the mixed formula & catalyst will be laid on to the mould in predetermined & even proportions and so allow for a reduced gellation period for curing.

PART TWO:

With the use of the technical features as set out in Part One and the established prior art, currently in operation throughout industry, the invention is a system for the manufacture of fibreglass, cultured marble & onyx products - which the applicant seeks to protect.

The system provides for strong quality control, throughout manufacture to attain a product with uniform pattern & colour together with a reduced labour content of some 80% - when compared to present production methods using established prior art. A chart of the comparative labour content for the production of three (3) vanity tops - each 910 mm x 520 mm wide x 18 mm thickness & complete with a single bowl - using a conventional system & The Roberts System, is set out on page 2 attached.





THE ROBERTS SYSTEM - CLAIMS (CONTINUED)PART TWO: Continued

Comparison of labour content for 3 vanity tops & basins  
 Conventional System & Roberts System

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<u>PROCESS</u>	<u>MIX/POUR</u>	<u>ROBERTS.</u>
(a) Mixing time	25 mins.	3 mins.
(b) Pouring/Application	15 "	5 "
(c) Gellation	15 "	3 "
(d) Cleaning of equipment		
-bowls/buckets/mixing head	15 "	3 "
	<hr/>	<hr/>
<u>TOTAL:</u>	70 mins	14 mins.
	<hr/>	<hr/>

When using the Roberts System, a saving of some 56 minutes is effected in comparison to the mechanical mix & hand pour application which is the conventional or existing art, now extensively in use.

Adapted to percentages, the use of the Roberts System reduces the labour content for each moulded product to some 20% of that produced by use of conventional or existing art systems - a saving of some 80%.

## AMENDED CLAIMS

PART ONE: (received by the International Bureau on 18 August 1982 (18.08.82))

ORIGINAL - The invention has adopted the following technical features to manufacture fibreglass, cultured marble & onyx products - in addition to the established prior art and currently being used throughout the industry.

1. ORIGINAL - Preheating of the moulds to approximately 30 degrees Centigrade.
2. ORIGINAL - Continuous mixing & paddling of the uncatalysed resins, calcite & pigments - whilst being stored in a stainless steel or aluminium container with stainless steel or aluminium blades fitted to the inner - such blades to be driven by an electric motor.
3. AMENDED - Depositing of the colouring mediums in powder form before the Gelcote is applied to the mould surfaces.

Bronzing powders such as Wolestonholme type or similar are deposited to the mould surfaces - which have been lightly waxed and then polished with cotton or similar buffs to create a static field. The powders are deposited by way of brushing - either by hand, air or other mechanical means to a predetermined pattern.

The bronzing <sup>/powders</sup> are statically charged and cling to the waxed surface in the pattern applied and the Gelcote is then deposited over the surfaces. The powders then dissipate throughout the wet Gelcote in the general pattern applied and remain intact throughout gellation & curing.

4. ORIGINAL - Mechanical mixing & depositing of the paddled formula to the mould by using a modified Binks, Bullet, Glasscraft, Robertson or similar type depositor gun. When using this equipment, the mixed formula & catalyst will be laid on to the mould in predetermined & even proportions and so allow for a reduced gellation & curing period.



CLAIMS - AMENDED

5. NEW - All chemical components of the final mixture - including resins, calcite & pigments (Claim ) together with catalyst (Claim 4) and Gelcote (Claim 4) - are to be stored at a constant temperature of 30 degrees Centigrade, before being deposited to the moulds.
6. NEW - All mixtures and Gelcote contain an additive such as Potassium Oxide or Triethianolamine (TEA) or similar.- to accelerate or reduce gellation and curing times.
7. NEW - When using the features submitted in the claims 1/6, the initial articles of production are available in a minimum of time when compared with conventional methods, as temperatures and gellation & curing times are mechanically & chemically induced and so the manufacture is not dependant on ambient temperatures.
8. NEW - When using the technical features set out in the above claims numbered 1/6 inclusive - all of which reduce gellation and curing times - extensive savings in labour content are achieved and mould turnaround is increased, so giving greater productivity.

Both of these factors considerably reduce the labour cost of each finished article.

A comparative example of the savings in labour content, using this process and conventional methods, is set out below in Part Two.

PART TWO:

1. AMENDED - With the use of the technical features as set out in Part One, together with the established prior art in operation throughout the industry, the invention is a system or process for the manufacture of fibreglass, cultured marble & onyx products.
2. ORIGINAL - The system or process provides for strong quality control throughout manufacture to attain a product with uniform colour pattern & colour, together with a reduced labour content of some 80% - when compared to present production methods using established prior art.



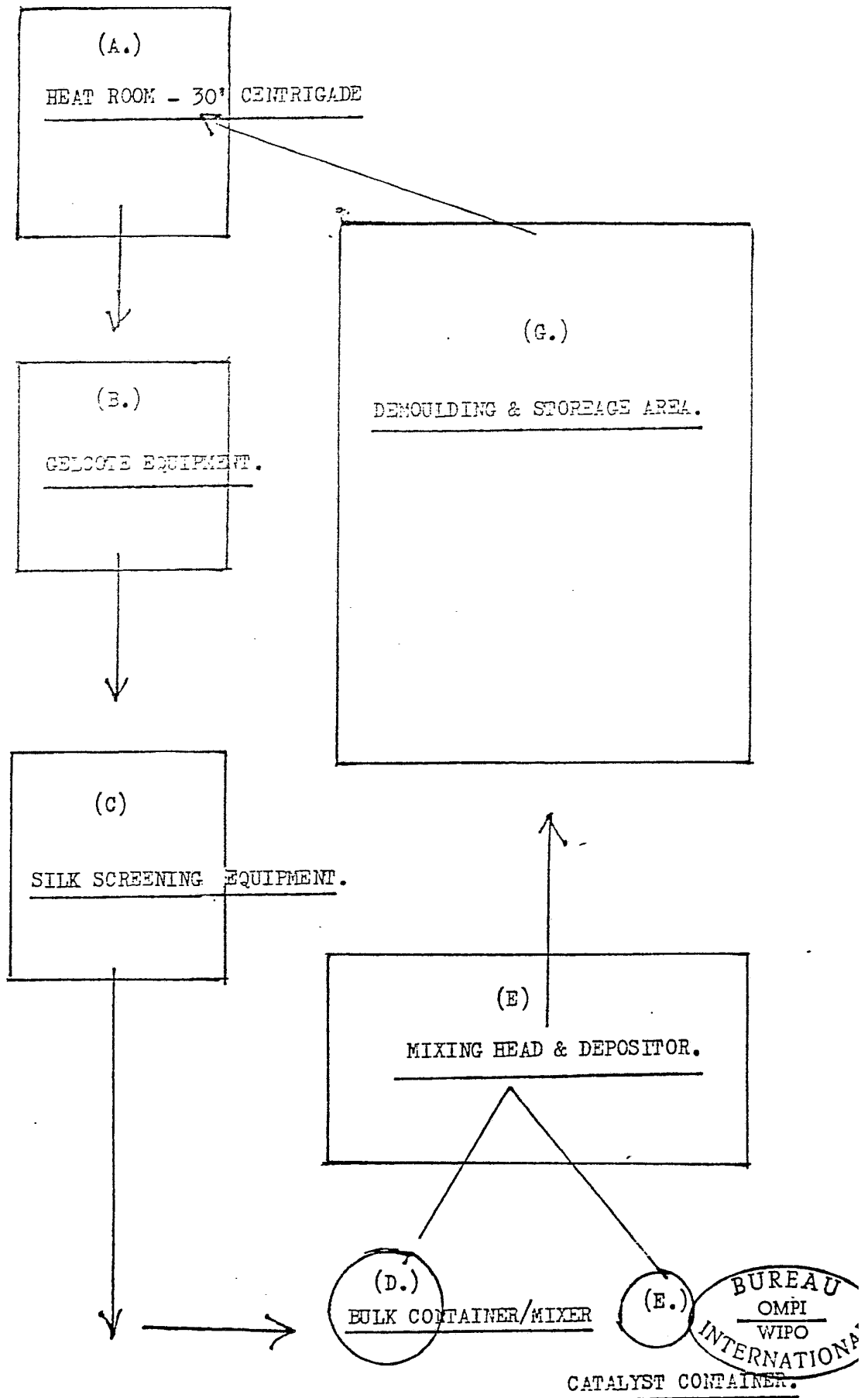
3. NEW - PART OF ORIGINAL 1/2 - The applicant seeks to protect the process and its benefits of quality control and savings effected by reduced labour content and mould turaround, as set out in claims 1/2 of Part Two of these claims.
4. ORIGINAL - A chart of the comparative labour content for the production of three - (3) vanity tops - each 910 mm long x 520 mm wide x 18 mm thickness and complete with a single integral bowl - using a conventional system and the Roberts System, is set out below:

PROCESS	CONVENTIONAL MIX/POUR	ROBERTS SYSTEM
(a) Mixing Time	25 minutes	3 minutes
(b) Pour/Deposit	15 "	5 "
(c) Gellation	15 "	3 "
(d) Cleaning of Equipment		
Bowls/Buckets	15 "	-
Mixing head	-	3 "
<u>TOTAL:</u>	<u>70 minutes</u>	<u>14 minutes</u>

5. AMENDED - When using the Roberts System, a saving of some 56 minutes is effected by this process - for the production of three similar articles - in comparison to the mechanical mix and hand pour method of application or depositing to the mould which is the conventional or existing art method, currently used extensively throughout the industry, to-day.
6. ORIGINAL - adapted to percentages the use of the Roberts System reduces the labour content for each moulded product to some 20% of that produced by use of conventional or existing art systems - a saving of some 80%.



SKETCH LAYOUT FOR WORKING AREAS - NOT TO SCALE



# INTERNATIONAL SEARCH REPORT

International Application No PCT/AU82/00005

<b>I. CLASSIFICATION OF SUBJECT MATTER</b> (if several classification symbols apply, indicate all) <sup>3</sup>		
According to International Patent Classification (IPC) or to both National Classification and IPC		
INT. CL <sup>3</sup> B28B 1/14, B29C 5/00, B29G 7/00, B41M 1/30		
<b>II. FIELDS SEARCHED</b>		
Minimum Documentation Searched <sup>4</sup>		
Classification System	Classification Symbols	
IPC	B29G 7/00 B41M 1/30	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched <sup>5</sup>		
AU: IPC AS ABOVE + IPC B28B 1/14, B29C 5/00; Australian Classification 18.3, 18.5		
<b>III. DOCUMENTS CONSIDERED TO BE RELEVANT</b> <sup>14</sup>		
Category *	Citation of Document, <sup>16</sup> with indication, where appropriate, of the relevant passages <sup>17</sup>	Relevant to Claim No. <sup>18</sup>
A	US,A, 4244993 (PLATKA et al) 13 January 1981 (13.01.81) (& JP,A, 56082212)	1-26
A	US,A, 3379592 (OSTROWICZ) 23 April 1968 (23.04.68) COL 3 Lines 20-31	1-10
A	US,A, 3773886 (STARR et al) 20 November 1973 (20.11.73)	1-13
X	AU,B, 54107/65 (402022) (BECK, KOLLER & COMPANY [ENGLAND] LIMITED) 21 July 1966 (21.07.66) Page 2	1-8
A	AU,A, 21919/70 (PERMALI LIMITED) 5 November, 1970 (05.11.70)	
A	GB,A, 1355414 (GRILLO-WERKE AKTIENGESELLSCHAFT) 5 June 1974 (05.06.74) Examples 1 + 2	1
A	DE,A, 2908596 (EUROFLOOR S.A.) 20 September 1979 (20.09.79)	
<p>* Special categories of cited documents: <sup>15</sup></p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&amp;" document member of the same patent family</p>		
<b>IV. CERTIFICATION</b>		
Date of the Actual Completion of the International Search <sup>19</sup>	Date of Mailing of this International Search Report <sup>19</sup>	
14 May 1982 (14.05.82)	20 May 1982 (20-05-82)	
International Searching Authority <sup>1</sup>	Signature of Authorized Officer <sup>20</sup>	
Australian Patent Office	D.B. CUPITT 