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DESCRIPTION

[0001] The present invention relates to paper pulp compositions and articles moulded therefrom.

[0002] GB-A-960941 discloses a method of production of moulded articles comprising the use of a precipitatable binding agent.

[0003] GB-A-2186215 discloses porous, fibrous structures comprising polytetrafluoroethylene fibers and a fluorocarbon binder.

[0004] It is known to form disposable urine bottles, bed pans and the like from paper pulp which, after use, can be placed in a macerator to reduce the particles to a size where they can be discharged into the normal sewer system. It would also be desirable to form other articles, notably wash basins, from paper pulp so that they too are disposable. However, whilst the moulding of wash bowls and the like presents few technical problems, it has been found that the presence of soap or detergent in the water carried by the wash bowl renders the moulded paper pulp article very absorbent, with the consequence that the article disintegrates very quickly, thereby rendering it unusable.

[0005] Therefore, for receptacles which are likely to come into contact with soap or detergent, it is not possible to form them from disposable paper pulp and instead reusable receptacles, usually formed from plastics, are used. These require thorough cleansing after each use, but even with very thorough cleaning, the risk of cross-contamination and cross-infection between patients remains.

[0006] It is an object of the present invention to provide a paper pulp formulation which can be made into moulded paper pulp articles which will allow the article to retain its shape and rigidity.

[0007] In accordance with a first aspect of the invention, there is provided a mouldable paper pulp composition comprising an aqueous suspension of:

1. (a) a base material comprising paper particles; and
2. (b) a detergent resistant binding agent for the paper particles,

[0008] in an intimate and substantially homogenous mix.

[0009] By including a detergent resistant binding agent in the formulation, it has been found that articles formed from the formulation do not disintegrate when they come into contact with soap solution or detergent solution. This makes the formulation particularly suitable for forming disposable wash bowls, which are likely to come into contact with soap solution or detergent solution in use. In addition, the composition provides the means for a cost effective process for the manufacture of articles capable of retaining their shape and rigidity since it is not necessary to adapt conventional moulding techniques or machinery to provide an article with the means to maintain its shape and rigidity.

[0010] The paper particles comprise a number of interwoven cellulose fibres. The detergent resistant binding agent is capable of binding the fibres of the paper particles together. The base material may further comprise an additional binder to improve the binding of paper fibres together. The binder may comprise a soluble wax. The soluble wax may be a natural (such as bee's wax) or synthetic (such as Alkyl Ketene Dimer (AKD) wax) wax. Preferably, the binder comprises a natural wax.

[0011] The composition may comprise 0 - 20% of binder by dry weight per Kg of dry base material, more preferably, 7 - 9 %.

[0012] In one embodiment, the composition further comprises a sizing agent. The sizing agent acts to improve the binding action of the binder and paper fibres and to lower the pH, improving the binding properties of the detergent resistant binding agent and/or binder so as to enable the moulded, finished article to better retain its shape. The sizing agent may be any suitable material capable of improving the binding of the detergent resistant binding agent and/or binder and paper fibres together. Preferably, the sizing agent comprises an aluminium salt. More preferably, the sizing agent comprises aluminium sulphate.

[0013] The composition may comprise an additional 0 - 300 g of sizing agent by dry weight per Kg of dry base material, more preferably, 200 - 230 g.

[0014] The paper particles may be derived from any suitable material, for example, in one embodiment the paper particles are

derived from recycled newspaper. The paper particles are advantageously derived from any recyclable source so as to minimise the environmental impact of the manufacturing process. The base material may comprise 65 - 100 % by dry weight of paper particles, more preferably, 80 - 95 %.

[0015] It has been found that by the addition of a detergent resistant binding agent, the finished article is resistant to the effects of soap and detergent solutions, with the effect that the finished article can withstand such solutions while remaining intact.

[0016] It has been found that an amount from 10ml to 200ml of the detergent resistant binding agent per Kg of dry base material is effective to provide the desired properties of resistance to soap and detergent. An amount of 10 to 100ml of detergent resistant binding agent per Kg of dry base material is preferred, more preferably, 30 - 40 ml.

[0017] Preferably the amount of detergent resistant binding agent in terms of solids content is 1 - 100 g per Kg of dry base material, more preferably 3 - 60 g, more preferably 3 - 30 g, more preferably 9 - 12 g.

[0018] The detergent resistant binding agent may comprise any material capable of providing sufficient detergent resistance to an article made from the composition so that the article can maintain its shape and rigidity even when in contact with soap and detergent solutions. Preferably, the detergent resistant binding agent comprises a fluorocarbon, more preferably, a fluorocarbon resin emulsion, such as Mystolene D2404.

[0019] In one embodiment, the detergent resistant binding agent is Mystolene D2404 (available from Catomance technologies Limited, 4 Caxton Place, Stevenage, SG1 2UF, UK).

[0020] When formulating the composition, the detergent resistant binding agent may advantageously be in the form of a resin, emulsion and/or resin emulsion. The detergent resistant binding agent acts to prevent the moulded article from disintegrating when in contact with soap and detergent solutions.

[0021] The composition may additionally comprise at least one biocide to prevent the growth of micro-organisms prior to, during and after the manufacture of an article. The biocide may comprise any one or more of the following group, which comprises biozynol and bactolyse (available from EKA Chemicals AB, Whiteberg Industrial Estate, Blackburn, Lancashire and Nalco Company, 1601 W. Diehl Road, Naperville, IL, 60563-1198 U.S.A). In a preferred embodiment, the composition comprises at least two different biocides.

[0022] The biocide is preferably present in an amount sufficient to arrest the growth of micro-organisms in the composition. More preferably, the composition comprises an additional 0 - 5 g of biocide per Kg of dry base material, even more preferably, 0.1 - 0.5 g.

[0023] In accordance with a second aspect of the present invention, there is provided an article manufactured from a composition as described hereinabove.

[0024] The articles manufactured using the composition of the present invention are, in addition to being resistant to soap and detergent solutions, capable of maintaining their shape and rigidity when contacted with engine oil, cooking oil, emulsion paint and/or wall paper paste.

[0025] By way of example only, a specific embodiment of the present invention will now be described.

[0026] A receptacle in the form of an open-topped wash bowl comprises a generally planar base and an upstanding peripheral enclosing wall, defining a containing volume. The wash bowl is formed from moulded paper pulp material in a known manner.

[0027] The relative proportions of the constituents of the paper pulp from which the wash bowl is formed are as follows (the amounts given are for the formation of 1 kg of dried paper pulp material):

915g of particulate waste paper (e.g. old newspaper).

85g of binder (e.g. wax, such as bees wax).

218g of a sizing agent (such as aluminium sulphate).

35 ml of a detergent resistant binding agent (e.g. a fluorocarbon resin emulsion such as Mystolene).

[0028] Optionally, the mixture may also contain one or more biocide materials.

[0029] The above components of the composition are suspended in water such that the solid particles form from 0.8% to 1.5% of the aqueous suspension. The pulp material is then formed into wash bowls on conventional paper pulp moulding machines and the formed articles are then dried in an oven to form the finished article.

[0030] In alternative embodiments, the pulp material is formed into other vessels for containing or receiving engine oil, cooking oil, emulsion paint and wall paper paste.

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- GB960941A [0002]
- GB2186215A [0003]

Patentkrav

1. Formbar sammensætning af papirmasse, der omfatter en vandholdig opslæmning af:

(a) et basismateriale, der omfatter papirpartikler; og

(b) et rensemiddelbestandigt bindemiddel til papirpartiklerne, i en inderlig og stort set homogen blanding.

2. Sammensætning ifølge krav 1, hvor basismaterialet omfatter et bindemiddel til at binde papirpartiklerne.

3. Sammensætning ifølge krav 2, hvor bindemidlet omfatter en naturlig eller syntetisk voks, f.eks. en naturlig voks.

4. Sammensætning ifølge krav 2 eller 3, hvor basismaterialet omfatter 0-20 % bindemiddel efter tørvægt pr. kg tørt basismateriale, f.eks. 7-9 % bindemiddel efter tørvægt pr. kg tørt basismateriale.

5. Sammensætning ifølge ethvert af de foregående krav, hvor basismaterialet omfatter 80-100 % efter tørvægt af papirpartikler.

6. Sammensætning ifølge ethvert af de foregående krav, hvor det rensemiddelbestandige bindemiddel omfatter et materiale, der kan levere tilstrækkelig vandbestandighed eller rensemiddelbestandighed over for en artikel fremstillet af sammensætningen, så artiklen kan opretholde sin form og stivhed, selv når den er i kontakt med sæbe- og rensemiddelopløsninger.

7. Sammensætning ifølge krav 6, hvor det rensemiddelbestandige bindemiddel omfatter et flourcarbon, f.eks. en harpiksemulsion af flourcarbon.

8. Sammensætning ifølge ethvert af de foregående krav, hvor det rensemiddelbestandige bindemiddel er til stede i en mængde fra 10 ml til 200 ml pr. kg

tørvægt af basismateriale, f.eks. fra 10 ml til 100 ml pr. kg tørvægt af basismateriale eller fra 30 ml til 40 ml pr. kg tørvægt af basismateriale.

9. Sammensætning ifølge ethvert af de foregående krav, som yderligere omfatter et appreturmiddel, for eksempel et aluminiumsalt, f.eks. aluminiumsulfat.

10. Sammensætning ifølge krav 9, hvor sammensætningen omfatter yderligere 0-300 g appreturmiddel efter tørvægt pr. kg tørt basismateriale, for eksempel yderligere 200-230 g appreturmiddel efter tørvægt pr. kg tørt basismateriale.

11. Sammensætning ifølge ethvert af de foregående krav, som yderligere omfatter mindst én biocid, for eksempel en biocid, der er udvalgt fra gruppen omfattende biozynol og baktolyse.

12. Sammensætning ifølge krav 11, hvor sammensætningen omfatter yderligere 0-5 g biocid pr. kg tørt basismateriale, for eksempel yderligere 0,1-0,5 g biocid pr. kg tørt basismateriale.

13. Artikel fremstillet af en sammensætning ifølge ethvert af kravene 1 til 12.

14. Artikel ifølge krav 13, hvor artiklen er en beholder.

15. Artikel ifølge krav 14, hvor beholderen er en vaskeskål med åben top.