FORM 2

THE PATENTS ACT 1970

39 OF 1970

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THE PATENT RULES 2003

COMPLETE SPECIFICATION

(SEE SECTIONS 10 & RULE 13)

1. TITLE OF THE INVENTION

A COW DUNG BASED ANTI-RADIATION SHEET AND METHOD OF PREPARATION THEREOF

2. APPLICANTS (S)

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2. PREAMBLE TO THE DESCRIPTION

COMPLETE SPECIFICATION

The following specification particularly describes the invention and the manner in which it is to be performed

A COW DUNG BASED ANTI-RADIATION SHEET AND METHOD OF PREPARATION THEREOF

TECHNICAL FIELD

[001] The present disclosure relates to a cow dung based anti-radiation sheet and method of preparation thereof.

BACKGROUND

[002] Background description includes information that may be useful in understanding the present invention. It is not an admission that any of the information provided herein is prior art or relevant to the presently claimed invention, or that any publication specifically or implicitly referenced is prior art.

[003] Cow dung, a useful and abundant material, is indigestible plant material released from the intestine of a cow. It is a useful material that helps us in a variety of ways. Due to its soft texture it tends to get deposited in a circular shape like – cow pies and cowpats. The manure is used as a rich fertilizer, which is an efficient fuel and biogas producer, a useful building material, raw material for making paper, and insect repellent.

[004] *Litsea glutinosa* wood is used for making agricultural tools, root fiber for making ropes and paper pulp, young leaves for fodder, seed oil for making candles, soaps and seed powder for treating skin boils. The bark mucilages consist of hetero-polysaccharide polyuronides consisting of sugar and uronic acid units which are formed from the cell wall and deposited on it in layers. These polyuronides swell in water and form a gel which is then used as binding agent. The bark of *L. glutinosa* is used to relieve pain, produce a soothing effect on the body and arrest bleeding. Bark paste is applied to bind fractured limbs and cure the wounds developed on the neck of bullocks due to frequent friction of the yoke with the body. The Bark

mucilage is experimentally proved to be an effective binding agent in tablet formulations. The large scale extraction of this glutinous bark is for Agarbatti (incense sticks) industries which use this bark. In Agarbatti making, the paste of the powdered bark is used as a binder for making incense sticks and cones due to its excellent viscosity and adhesive properties which aid in continuous burning.

[005] Edible gum is water soluble which makes it easy to mix with a range of ingredients. The gum is traditionally been used in remedies to tackle ailments like diarrhea, cough and congestion. Gondh or edible gum has long been used as a binding and a thickening agent by the food and pharmaceutical industry. It is also used as an emulsifier, stabilizer and as a texturant additive.

[006] Fuller's earth (FE) an alumina silicate, chemically inert, abundant in nature, known for its adsorptive properties, provides decontamination opportunities for chemical, biological, radiological and nuclear agents (Oubagaranadin, Sathyamurthy, & Murthy, 2007; Taysse, Daulon, Delamanche, Bellier, & Breton, 2007). FE is also currently used in fire-fighter decontamination processes in France (Secrétariat général de la défense nationale, 2008) and is provided as a powder in containers and prefilled gloves.

[007] Kaolin is used in a multiplicity of industries because of unique physical and chemical properties. Shape, particle size, color, softness, and non-abrasiveness are physical properties that are especially important. Chemical properties, such as comparatively low base exchange capacity, as well as other chemical properties of the kaolin surface, and relative insolubility, are governing in many uses. The application of kaolin is in paper, rubber, ceramics, plastics, ink, catalysis, insecticides, and numerous other uses. X-ray shielding behaviour of kaolin has been reported.

[008] Cow dung has been used in radiation shielding in the past. However, use of only cow dung as anti-radiation material has some drawbacks. The binding

capacity of cow dung cake is not good and the cake is brittle in nature. Due to the low binding capacity, the cow dung cake can break easily. The cow dung cake is not easy to attach and binding to surface is not satisfactory.

[009] Therefore, the present disclosure overcomes the above-mentioned problem. All research publications herein are incorporated by reference to the same extent as if each individual publication or patent application were specifically and individually indicated to be incorporated by reference. Where a definition or use of a term in an incorporated reference is inconsistent or contrary to the definition of that term provided herein, the definition of that term provided herein applies. Accordingly, in some embodiments, the numerical parameters set forth in the written description and attached claims are approximations that can vary depending upon the desired properties sought to be obtained by a particular embodiment.

[0010] The recitation of ranges of values herein is merely intended to serve as a shorthand method of referring individually to each separate value falling within the range. Unless otherwise indicated herein, each individual value is incorporated into the specification as if it were individually recited herein. All methods described herein can be performed in any suitable order unless otherwise indicated herein or otherwise clearly contradicted by context. The use of any and all examples, or exemplary language (e.g., "such as") provided with respect to certain embodiments herein is intended merely to better illuminate the invention and does not pose a limitation on the scope of the invention otherwise claimed. No language in the specification should be construed as indicating any non-claimed element essential to the practice of the invention.

OBJECTS OF THE INVENTION

[0011] It is an object of the present disclosure to provide a cow dung based anti-radiation sheet.

[0012] It is an object of the present disclosure to provide a method of preparation of cow dung based anti-radiation sheet.

SUMMARY

[0013] The present disclosure relates to a cow dung based anti-radiation sheet comprising of cow dung; *Litsea glutinosa* bark; edible gum; Fuller's earth; and Kaolin.

[0014] In an aspect of the present disclosure, the cow dung is 60% by weight, the *Litsea glutinosa* bark is 10-20% by weight, the edible gum is 10-20% by weight, the Fuller's earth is 5% by weight and the Kaolin is 5% by weight.

[0015] The present disclosure also relates to a method for preparation of a cow dung based anti-radiation sheet, the method comprising of adding cow dung, *Litsea glutinosa* bark and edible gum with water in a vessel; stirring with a mechanical stirrer to form a mixture; heating the mixture for 15-25 minutes to stabilize the mixture; cooling the mixture at room temperature; adding Fuller's earth and Kaolin in the mixture; centrifuging the mixture; keeping the mixture for 15-25 minutes at 15-20°C; rolling by a rolling pin to prepare a flat sheet; drying the sheet in an oven; and applying glue on the dried sheet to paste on a surface.

[0016] In an aspect of the present disclosure, the cow dung is 60% by weight, the *Litsea glutinosa* bark is 10-20% by weight and the edible gum is 10-20% by weight.

[0017] In an aspect of the present disclosure, the stirring of the mixture is done by the mechanical stirrer at a speed of 150-300 rpm.

[0018] In an aspect of the present disclosure, the mixture is heated at a temperature of 70°C-80°C for stabilizing.

[0019] In an aspect of the present disclosure, the Fuller's earth is 5% by weight and the Kaolin is 5% by weight

[0020] In an aspect of the present disclosure, the centrifuging of mixture is done at 1500-2000 rpm for 5-10 minutes.

[0021] In an aspect of the present disclosure, the flat sheet is of thickness 2mm-20mm.

[0022] In an aspect of the present disclosure, the drying of the sheet in the oven is done at a temperature of 110°C-160°C.

DETAILED DESCRIPTION OF THE INVENTION

[0023] In the following description, numerous specific details are set forth in order to provide a thorough understanding of embodiments of the present invention. It will be apparent to one skilled in the art that embodiments of the present invention may be practiced without some of these specific details. As the detailed description is concerned various stages are included in embodiments of the present invention, which will be detailed below. The stages can be carried out along with statistical data and by machine-executable instructions, which can be used to direct a general-purpose or special-purpose processor to carry out the procedures. If the specification states a component or feature "may", "can", "could", or "might" be included or have a characteristic, that component or feature is not required to be included or have the characteristic.

[0024] Aspects of the present disclosure to provide a cow dung based anti-radiation sheet and method of preparation thereof.

[0025] It is inferred that the foregoing description is only illustrative of the present invention, and it is not intended that invention be limited or restrictive

thereto. Many other specific embodiments of the present invention will be apparent to one skilled in the art from the foregoing disclosure. All substitutions, alterations and modifications of the present invention which comes within the scope of the following claims are to which the present invention is readily susceptible without departing from the spirit of the invention. The scope of the invention should therefore be determined not with reference to appended claims but along with the full scope of equivalents to which such claims are entitled.

[0026] Thus, for example, it will be appreciated by those of ordinary skill in the art that the diagrams, schematics, illustrations, and the like represent conceptual views or processes illustrating systems and method embodying this invention. Those of ordinary skill in the art further understand that the exemplary processes, method, and/or pharmaceutical components described herein are for illustrative purposes and, thus, are not intended to be limited to any named.

[0027] The following is a detailed description of embodiments of the disclosure depicted in the accompanying drawings. The embodiments are in such detail as to clearly communicate the disclosure. However, the amount of detail offered is not intended to limit the anticipated variations of embodiments; on the contrary, the intention is to cover all modifications, equivalents, and alternatives falling within the spirit and scope of the present disclosure as defined by the appended claims.

[0028] Various terms as used herein are shown below. To the extent a term used in a claim is not defined below, it should be given the broadest definition persons in the pertinent art have given that term as reflected in printed publications and issued patents at the time of filing.

[0029] In an embodiment of the present disclosure, a cow dung based anti-radiation sheet is disclosed. The cow dung based anti-radiation sheet is composed of

cow dung along with other ingredients. The cow dung based anti-radiation sheet comprising of cow dung, *Litsea glutinosa* bark, edible gum, Fuller's earth and Kaolin.

[0030] In an embodiment of the present disclosure, the ingredients i.e. cow dung, *Litsea glutinosa* bark, edible gum, Fuller's earth and Kaolin are in specific percentages. The cow dung is 60% by weight, the *Litsea glutinosa* bark is 10-20% by weight, the edible gum is 10-20% by weight, the Fuller's earth is 5% by weight and the Kaolin is 5% by weight.

[0031] In an embodiment of the present disclosure, the ingredients i.e the cow dung is 60% by weight, the *Litsea glutinosa* bark is 15% by weight, the edible gum is 15% by weight, the Fuller's earth is 5% by weight and the Kaolin is 5% by weight.

[0032] In an embodiment of the present disclosure, a method for preparation of a cow dung based anti-radiation sheet is disclosed. The method comprising of following steps:

adding cow dung, *Litsea glutinosa* bark and edible gum with water in a vessel,
stirring with a mechanical stirrer to form a mixture,
heating the mixture for 15-25 minutes to stabilize the mixture,
cooling the mixture at room temperature,
adding Fuller's earth and Kaolin in the mixture,
centrifuging the mixture,
keeping the mixture for 15-25 minutes at 15-20°C,
rolling by a rolling pin to prepare a flat sheet,
drying the sheet in an oven, and
applying glue on the dried sheet to paste on a surface.

[0033] In an embodiment of the present disclosure, the ingredients i.e. cow dung, *Litsea glutinosa* bark, edible gum, Fuller's earth and Kaolin are in specific percentages. The cow dung is 60% by weight, the *Litsea glutinosa* bark is 10-20% by

weight, the edible gum is 10-20% by weight, the Fuller's earth is 5% by weight and the Kaolin is 5% by weight.

[0034] In an embodiment of the present disclosure, the ingredients i.e the cow dung is 60% by weight, the *Litsea glutinosa* bark is 15% by weight, the edible gum is 15% by weight, the Fuller's earth is 5% by weight and the Kaolin is 5% by weight.

[0035] In an embodiment of the present disclosure, the stirring of the mixture is done by the mechanical stirrer at a speed of 150-300 rpm.

[0036] In an embodiment of the present disclosure, the mixture is heated for 15-25 minutes to stabilize the mixture. The mixture is heated at a temperature of 70°C-80°C for stabilizing. The heating of the mixture creates bonding between the ingredients i.e. cow dung, *Litsea glutinosa* bark and edible gum. This results in stabilization of the ingredients.

[0037] In an embodiment of the present disclosure, the centrifuging of the prepared mixture is done at 1500-2000 rpm for 5-10 minutes.

[0038] In an embodiment of the present disclosure, after centrifuging the mixture, it is kept for 15-25 minutes at 15-20°C. The temperature range of 15-20°C enables proper bonding and binding capacity of the Fuller's earth and Kaolin with the mixture. This gives the cow dung based anti-radiation sheet optimum hardness and texture with good binding capacity.

[0039] In an embodiment of the present disclosure, a rolling pin is used to roll and prepare a flat sheet. The flat sheet can be of thickness 2mm-20mm.

[0040] In an embodiment of the present disclosure, after rolling by a rolling pin to prepare a flat sheet, the sheet is dried in an oven. The drying of the sheet in the oven is done at a temperature of 110°C-160°C. The oven drying done for maintaining

optimum moisture content of the cow dung based anti-radiation sheet. This ensures optimum hardness of the cow dung based anti-radiation sheet.

[0041] The cow dung based anti-radiation sheet prepared from the disclosed method was tested for radiation shielding ability. The anti-radiation effect was evaluated using a galvanometer. The galvanometer was tested for deflection by the radiation of a radiation emitting device in proximity. The radiation devices used are television and computer/laptop.

[0042] Different samples of the cow dung based anti-radiation sheet were prepared to evaluate the anti-radiation effect. The samples prepared with the quantity of the ingredients and preparation conditions are given below.

Table 1- Comparison of ingredients in samples of the cow dung based anti-radiation sheet

Ingredients	**Sample A**	**Sample B**	**Sample C**
cow dung	60%	50%	60%
Litsea glutinosa bark	20%	20%	15%
edible gum	20%	20%	15%
Fuller's earth	Not present	5%	5%
Kaolin	Not present	5%	5%

Table 2- Comparison of preparation conditions in samples of the cow dung based anti-radiation sheet

Preparation conditions	**Sample A**	**Sample B**	**Sample C**
Stirring speed	150	200 rpm	300 rpm
Heating temperature	70°C	75°C	80°C
Centrifugation speed	1500	1800	2000
Thickness of samples	8mm	10mm	12mm
Oven drying temperature	110°C	130°C	160°C

[0043] The galvanometer was tested for deflection by the radiation of a radiation device in proximity. The deflection of galvanometer shows the effect of radiation device and cow dung based anti-radiation sheet on human body potential. Comparison of the Sample A, Sample B, Sample C and cow dung cake for anti-radiation effect is given below in table 3.

Table 3- Comparison of effect of cow dung based anti-radiation sheet on human body potential

Sr. No.	Deflection of Galvanometer (mm)					
	Human without	Human with a	Radiation device with	Radiation device	Radiation device	Radiation device

	a radiation device	radiation device in proximity	cow dung cake	with Sample A	with Sample B	with Sample C
1.	35	17	22	26	29	32
2.	22	11	13	14	17	19
3.	19	9	11	14	16	18
4.	18	6	7	10	12	15
5.	28	16	18	20	23	26

[0044] Results show that the cow dung cake deflected galvanometer to some extent i.e. demonstrated anti-radiation effect. Sample A displayed a better anti-radiation shielding effect than the cow dung cake. Sample B and sample C performed better than the cow dung cake and Sample A which does not contain Fuller's earth and Kaolin. Sample C prepared from the disclosed method demonstrated significant anti-radiation shielding effect. This shows that Sample C of the cow dung based anti-radiation sheet has the optimum level of ingredients for superior anti-radiation activity.

[0001] The advantages of the cow dung based anti-radiation sheet prepared from the disclosed method includes:

- The binding capacity is good due to Fuller's earth and Kaolin.
- Superior radiation shielding effect has a potential for use with radiation devices such as television and computers.
- The sheet layer has optimum thickness with good surface binding capacity.
- The hardness of sheet is optimum, it is not brittle and does not break easily.

I/We claim:

1. A cow dung based anti-radiation sheet comprising of:
cow dung;
Litsea glutinosa bark;
edible gum;
Fuller's earth; and
Kaolin.

2. The cow dung based anti-radiation sheet as claimed in claim 1, wherein the cow dung is 60% by weight, the *Litsea glutinosa* bark is 10-20% by weight, the edible gum is 10-20% by weight, the Fuller's earth is 5% by weight and the Kaolin is 5% by weight.

3. A method for preparation of a cow dung based anti-radiation sheet, the method comprising of:
adding cow dung, *Litsea glutinosa* bark and edible gum with water in a vessel;
stirring with a mechanical stirrer to form a mixture;
heating the mixture for 15-25 minutes to stabilize the mixture;
cooling the mixture at room temperature;
adding Fuller's earth and Kaolin in the mixture;
centrifuging the mixture;
keeping the mixture for 15-25 minutes at 15-20°C;
rolling by a rolling pin to prepare a flat sheet;
drying the sheet in an oven; and
applying glue on the dried sheet to paste on a surface.

4. The method for preparation of a cow dung based anti-radiation sheet as claimed in claim 3, wherein the cow dung is 60% by weight, the *Litsea glutinosa* bark is 10-20% by weight and the edible gum is 10-20% by weight.

5. The method for preparation of a cow dung based anti-radiation sheet as claimed in claim 3, wherein the stirring of the mixture is done by the mechanical stirrer at a speed of 150-300 rpm.

6. The method for preparation of a cow dung based anti-radiation sheet as claimed in claim 3, wherein the mixture is heated at a temperature of 70°C-80°C for stabilizing.

7. The method for preparation of a cow dung based anti-radiation sheet as claimed in claim 3, wherein the Fuller's earth is 5% by weight and the Kaolin is 5% by weight.

8. The method for preparation of a cow dung based anti-radiation sheet as claimed in claim 3, wherein the centrifuging of mixture is done at 1500-2000 rpm for 5-10 minutes.

9. The method for preparation of a cow dung based anti-radiation sheet as claimed in claim 3, wherein the flat sheet is of thickness 2mm-20mm.

10. The method for preparation of a cow dung based anti-radiation sheet as claimed in claim 3, wherein the drying of the sheet in the oven is done at a temperature of 110°C-160°C.

ABSTRACT

A COW DUNG BASED ANTI-RADIATION SHEET AND METHOD OF PREPARATION THEREOF

The present invention relates to a cow dung based anti-radiation sheet comprising of cow dung; *Litsea glutinosa* bark; edible gum; Fuller's earth; and Kaolin. The present invention also relates to a method for preparation of a cow dung based anti-radiation sheet. the method comprising of adding cow dung, Litsea glutinosa bark and edible gum with water in a vessel; stirring with a mechanical stirrer to form a mixture; heating the mixture for 15-25 minutes to stabilize the mixture; cooling the mixture at room temperature; adding Fuller's earth and Kaolin in the mixture; centrifuging the mixture; keeping the mixture for 15-25 minutes at 15-20°C; rolling by a rolling pin to prepare a flat sheet; drying the sheet in an oven; and applying glue on the dried sheet to paste on a surface. Testing by galvanometer shows that the cow dung based anti-radiation sheet has optimum level of ingredients for superior anti-radiation activity.