Invention of WASTE ASSIMILATOR for decentralized biodegradable solid waste management and organic farming

Fig.: Need of an invention for organic farming to save the "food chain"

Introduction:

At the present scenario, use of chemical pesticides and excessive use of inorganic manures damage the natural microbial life which are beneficial to the soil system and accordingly cause loss of biodiversity. In this process the "food chain" is deteriorating day by day affecting the entire ecosystem of the earth.

Moreover, large quantities of agricultural wastes are being burned every year to reduce the volume and release significant amounts of *Green House Gases* (*GHGs*) like carbon dioxide (CO2), methane (CH4) and nitrous oxide (N2O).

On the other hand as per the WHO, only organic farming can provide us a viable option for feeding the earth with adequate nutrition and which is also along with a healthy ecosystem. Whereas as per the latest global data, only 1.5% of the world's agricultural land is organic. In this connection only **'widespread small scale organic farming in every nook and corner is the logical solution to India's as well as Global needs'.** Remarkably, due to the lack of adequate amounts of 'organic manure' and 'pest-repellent', it was practically not possible to practice organic farming and replace the present 'conventional' farming practice with the use of inorganic manure and chemical pesticides.

It was also noticed that in spite of using organic manure, most of the organic farming practices have failed in India after the use of chemical pesticide over the pest affected crops.

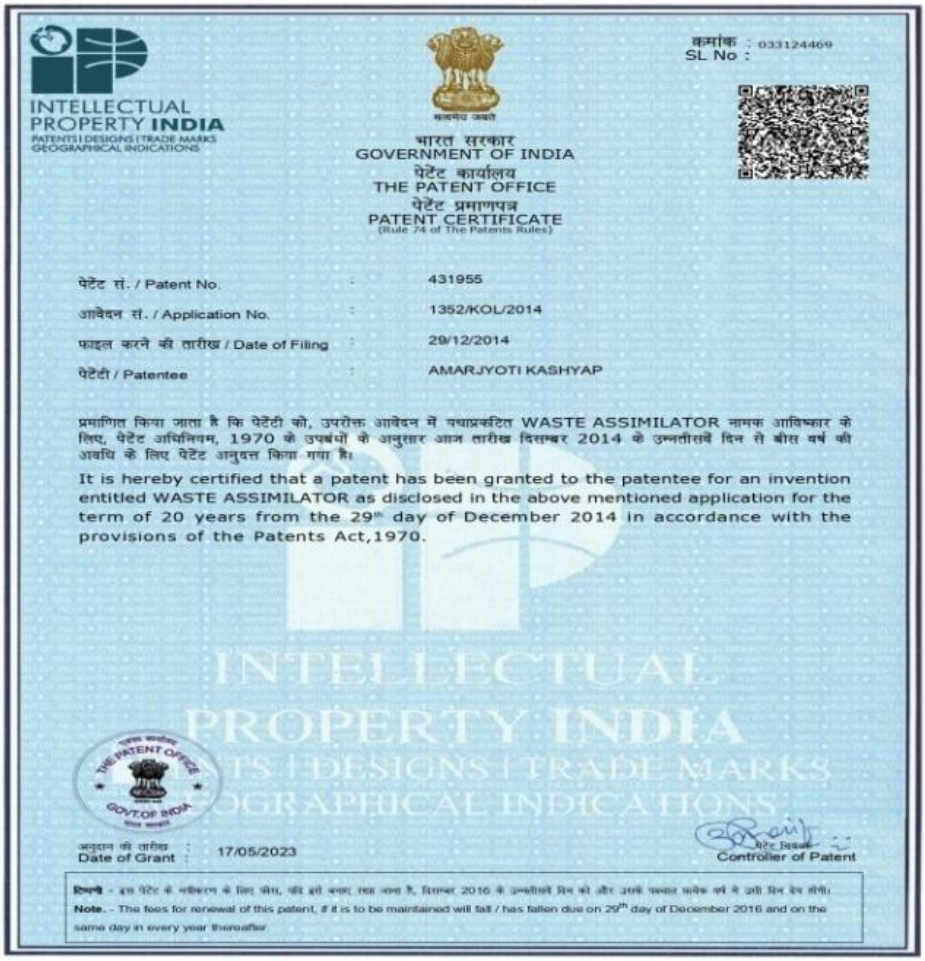
Therefore, there was an urgent need to innovate a technology that produce 'organic manure' and 'pest repellent' on daily basis by utilizing the abundantly available daily generated compostable solid waste including food and agricultural waste to promote organic farming in every household for feeding all with adequate nutrition and to maintain the "food chain" for balanced ecosystem.

Invention:

Considering the necessity, Dr. Amarjyoti Kashyap, founder president of ENVIRON has invented a "WASTE ASSIMILATOR" (*Patent No. 431955*), through which it is now possible to transform abundantly available daily generated compostable solid waste into 'organic manure' and 'pest repellent' (on daily basis) which finds large application in 'Organic Farming' in every household of India and abroad.

Through the use of "WASTE ASSIMILATOR", all the daily generated biodegradable solid waste including 'vegetable & fruit waste', 'meat & fish waste', 'eggshells', 'agricultural waste', 'garden waste', 'forest waste', 'leaf-litters', 'aquatic plant waste', 'cattle dung' etc. can directly be utilized as resource at source to produce 'Organic Manure cum Pest-Repellent' on daily basis.

After the invention of "WASTE ASSIMILATOR", it is becoming possible to produce adequate amount of 'organic manure' and 'pest repellent' through the abundantly available daily generated biodegradable solid waste to practice organic farming in every household of India and even in abroad. Thus, the invention of "Waste Assimilator" has brought about the much-needed 'CONVERGENCE' between the Waste Management & Organic Farming. Moreover, INTRODUCTION OF "WASTE ASSIMILATOR" IS ALSO GOING TO ABOLISH THE PRESENT CONCEPT OF PURCHASING INORGANIC MANURE AND PESTICIDE BY THE FARMERS to achieve self sustainability in organic farming practice.



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भारत सरकार
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THE PATENT OFFICE
पेटेंट प्रमाणपत्र
PATENT CERTIFICATE
(Rule 74 of The Patents Rules)

पेटेंट सं. / Patent No.	:	431955
आवेदन सं. / Application No.	:	1352/KOL/2014
फाइल करने की तारीख / Date of Filing	:	29/12/2014
पेटेंटी / Patentee	:	AMARJYOTI KASHYAP

प्रमाणित किया जाता है कि पेटेंटी को, उपरोक्त आवेदन में यथाप्रकटित WASTE ASSIMILATOR नामक आविष्कार के लिए, पेटेंट अधिनियम, 1970 के उपबंधों के अनुसार आज तारीख दिसम्बर 2014 के उन्तीसवें दिन से बीस वर्ष की अवधि के लिए पेटेंट अनुदत्त किया गया है।

It is hereby certified that a patent has been granted to the patentee for an invention entitled WASTE ASSIMILATOR as disclosed in the above mentioned application for the term of 20 years from the 29th day of December 2014 in accordance with the provisions of the Patents Act,1970.

THE PATENT OFFICE GOVT.OF INDIA

अनुदान की तारीख : 17/05/2023
Date of Grant :

Controller of Patent

टिप्पणी - इस पेटेंट के नवीकरण के लिए फीस, यदि इसे बनाए रखा जाना है, दिसम्बर 2016 के उन्तीसवें दिन को और उसके पश्चात प्रत्येक वर्ष में उसी दिन देय होगी।
Note. - The fees for renewal of this patent, if it is to be maintained will fall / has fallen due on 29th day of December 2016 and on the same day in every year thereafter

Fig.: Patent document

Novelty of the "WASTE ASSIMILATOR":

Unlike the other 'Composting' and 'Vermicomposting' device, "WASTE ASSIMILATOR" is an improved and very simple technology for decomposing the daily generated biodegradable solid waste through natural aerobic microbial digestion and assimilation by the Earthworm. "WASTE ASSIMILATOR" does not require any additives like 'Water Soaking Materials' and 'Microbes'; 'No shredding', 'No rotation' of the waste is required; long lasting environment friendly concrete device with zero maintenance cost; **it produces 'microbial-wash' from 2-3 days of use and 'vermi-wash' from 25 days on daily basis and till the assimilation process is complete and finally 'vermicompost' after 120 days.**

Outputs of the “WASTE ASSIMILATOR”:

“WASTE ASSIMILATOR” produces microbial cum vermiwash and finally vermicompost which contains: Nitrogen, Phosphorus, Potash, Amino Acid, Enzymes, Organic Carbon, Calcium, Magnesium, Zinc, Iron along with Vitamins, different Hormones and many useful microbes which is also having the properties of ‘pest-repellent’.

Categories of the “WASTE ASSIMILATOR”:

“WASTE ASSIMILATOR” is of two categories: one is small (dimension: 2.25 square feet) for domestic use and another one is bigger for community use (dimension: 165 square feet). Disposal capacity of small/domestic “Waste Assimilator” is 1kg compostable solid waste per day for 90 days per “Waste Assimilator”; whereas disposal capacity of bigger/community “Waste Assimilator” is 100kg compostable solid waste per day for 90 days per chamber.

Procedures of domestic “WASTE ASSIMILATOR”:

i. Dispose of compostable solid waste (approximate 1 kg) on a daily basis inside the composting bed by opening the top cover of “WASTE ASSIMILATOR” for 90 days or until the filling of the ‘Assimilator’.

ii. Spray water (approx 100ml) over the waste on a daily basis.

iii. Collect the ‘Microbial-Wash’ after 3 days from the outlet of the “WASTE ASSIMILATOR” on a daily basis and use in 1:5 dilution processes as organic manure cum pest repellent.

iv. Add Earthworm (approximate 50 nos.) over the decomposed waste after 5-7 days of use (collected from the local decayed Banana plants).

v. Collect the ‘Microbial-Wash’ cum ‘Vermiwash’ from the outlet of the “WASTE ASSIMILATOR” on a daily basis till the assimilation process completes and use in 1:10 dilution processes as organic manure cum pest repellent.

vi. During the process of deposition of waste and waste assimilation process, two numbers of “WASTE ASSIMILATOR” are required to maintain the continuous activity. For this, the use of the second assimilator is necessary after the first one is filled up.

vii. Rest the first “WASTE ASSIMILATOR” after 90 days and then use the second Assimilator and continue the process.

viii. In this process, during the use of the ‘second assimilator’, the ‘first one’ gets filled up with vermicompost and earthworm and then transfers the multiple nos. of earthworms into the ‘second assimilator after sieving.

ix. Finally collect the vermicompost from the ‘first Assimilator’ as the end product after 120 days.

x. This process continues simultaneously.

Procedures of community “WASTE ASSIMILATOR”:

i. Dispose of compostable solid waste (approximately 100 kg) on a daily basis inside the composting bed by opening the top moistened cover made up from the ‘Jute bags’ for 90 days or until the filling of the first chamber.

ii. Spray water (approx 10000ml) over the waste on a daily basis.

iii. Collect the ‘Microbial-Wash’ after 3 days from the outlet of the first chamber on a daily basis and use in 1:5 dilution processes as organic manure cum pest repellent.

iv. Add Earthworm (approximate 5000 nos.) over the decomposed waste after 5-7 days of use (collected from the local decayed Banana plants).

v. Collect the ‘Microbial-Wash’ cum ‘Vermiwash’ from the outlet of the first chamber of “WASTE ASSIMILATOR” on a daily basis and use in 1:10 dilution processes as organic manure cum pest repellent.

vi. Community “WASTE ASSIMILATOR” has two (2) chambers to maintain the continuous activity. For this, the use of the second chamber is necessary after the first one is filled up.

vii. Rest the first chamber of “WASTE ASSIMILATOR” after 90 days and then use the second chamber to continue the process.

viii. In this process, during the use of the ‘second chamber’, the ‘first one’ gets filled up with vermicompost and earthworm and then transfers the multiple nos. of earthworms into the ‘second chamber’ after sieving.

ix. Finally collect the Vermicompost from the first chamber of “WASTE ASSIMILATOR” as the end product after 120 days.

x. This process continues simultaneously.

Fig.: Use of domestic “Waste Assimilator”

Fig. : Use of community “Waste Assimilator”

Cost and benefits of the “WASTE ASSIMILATOR”:

Cost of one set (two numbers) small/domestic “WASTE ASSIMILATOR” is INR 5000.00. It can generate revenue INR 21,000.00/annum out of the ‘Microbial-wash’, ‘Vermin-wash’ and ‘Vermicompost’.

Cost of one bigger/community “WASTE ASSIMILATOR” (double chambered) is INR 4, 50,000.00. It can also generate revenue INR 10, 50,000.00 /annum out of the ‘Microbial-wash’, ‘Vermin-wash’ and ‘Vermicompost’.

Feasibility:

Invention of “WASTE ASSIMILATOR” has developed the much needed ‘CONVERGENCE’ between the waste management and organic farming. Similarly, technology of the “WASTE ASSIMILATOR” is evolved enough to maintain the food chain for a balanced ecosystem. It is very simple to use, by adopting simply ‘use and throw’ practice of biodegradable solid waste on a daily basis in an odor free hygienic environment. It needs very little space, only 2.25 square feet area for domestic/small “WASTE ASSIMILATOR” and 165 square feet area for community/large size “WASTE ASSIMILATOR”. It is a long lasting concrete device with no maintenance cost. “WASTE ASSIMILATOR” can be introduced in ‘rural household’, ‘urban household’, ‘residential colony’, ‘educational institutions’ and for large scale ‘biodegradable solid waste management & organic farming’.

Invention of “WASTE ASSIMILATOR” has now developed a guideline to practice organic farming in every nook and corner by utilizing the abundantly available daily generated

biodegradable solid waste. Accordingly, the 'products' of the "Waste Assimilator" is going to replace the present concept of using inorganic manure and chemical pesticide to maintain the "food chain" for balanced ecosystem.

Environmental Impact:

Ongoing ill-effects of global warming, excessive deforestation and widespread pollution, indiscriminate dumping of solid waste, excessive use of inorganic manure and chemical pesticides have started taking a toll on our environment, where there is an urgent need for developing organic, sustainable means for a healthy environment. This is why growing organic vegetables and recycling of compostable solid waste should be our top priority as implemented by ENVIRON, if we focus on reversing the negative impact on our depleting ecosystem. After the invention of "WASTE ASSIMILATOR", it has now becoming possible to transform all the compostable solid waste into something productive like 'Microbial-wash' and 'Vermi-wash' (on daily basis) and finally 'Vermicompost' which finds large application in Organic Farming.

Scalability:

Organic Farming is a Global need. It is observed that in spite of using organic manure, most of the organic farming practices are failed in the 'World' due to the use of chemical pesticide over pest infested crops and due to the lack of required amount of 'Pest Repellent' which also damage the natural microbial life. After the invention of the "WASTE ASSIMILATOR" it is now possible to produce adequate amounts of 'organic manure' and 'pest repellent' by utilizing all the unwanted compostable solid waste to practice organic farming in every nook and corner of the 'World'.

Thus the invention of "WASTE ASSIMILATOR" is now generating the concept of 'Solid Waste Management and Organic Farming' which is also opening a path for the basic economic growth and to build an organically green, economically sound, healthy & sanitized Nation.

On the other hand, according to the World Food Program, at the present scenario one in every nine people is not getting enough to eat. Experts say that the problem isn't that we won't have enough food, it's that the current agricultural system which is failing us to provide adequate nutrients. Only organic farming can provide us a viable option for feeding the people with adequate nutrients. Foods from organic farms are loaded with nutrients such as vitamins, enzymes, minerals and other micro-nutrients compared to those from conventional farms. Whereas, small scale organic farming is the only logical solution to the

world's food needs. Thus, the invention of "WASTE ASSIMILATOR" has now opened a path to initiate an ***Organically Green & Healthy World with Sustainable Food for feeding the whole world with adequate nutrients.***

ENVIRON has already introduced "WASTE ASSIMILATOR" in three different states of India namely Assam, Arunachal Pradesh and West Bengal for practicing compostable waste management and organic kitchen gardening including domestic organic 'Tea' gardening which is also contributing significant reduction of greenhouse gas along with positive impact on people and the earth.

Where the activities are achieved the following positive effects:

i. Abundantly available compostable solid wastes are converted to produce 'Organic Manure' and 'Pest Repellent' on a daily basis.

ii. Increase soil fertility by using organic manure instead of synthetic fertilizers.

iii. Decrease chances of food toxicity by using "microbial-wash" and "vermi-wash" instead of chemical pesticide.

iv. Reduction of land pollution and contamination of nearby water bodies.

v. Increase in productivity of rice, vegetables and fruits.

vi. High Income generation with higher profit rate due to the great demand of organic crops and manure.

vii. Entrepreneurship development with better marketing of the end product like organic manure, pest-repellent including organic rice, vegetables and fruits.

viii. Increase in income obviously leads to an improve living standards

ix. Creation of work culture among the beneficiaries.

x. Development of an organically green, economically sound and healthy society.

xi. Maintaining the "Food Chain" for a balanced ecosystem.

Donated for the Nation:

Dr. Amarjyoti Kashyap has donated his patented technology "WASTE ASSIMILATOR" for the nation for a clean and organically green India. Dr. Kashyap is now sharing his technology among the people at free of cost and initiating a clean and organic green movement. Through the use of "WASTE ASSIMILATOR" more than 60% domestic solid waste problem can be solved and a significant reduction of the roadside dumps can be achieved, Kashyap et al. (2017).

Fig.: Decentralized waste management and organic farming

Conclusion:

Due to the use of “WASTE ASSIMILATOR”, indiscriminate dumping of food and other compostable solid waste in the drain, roadside and low lying areas can be protected; burning of ‘Agricultural waste’ and ‘Leaf litter’ for reducing the volume can be prohibited and more than 60% household solid waste problems can be solved at source as resource for developing an *Organically Green, Economically Sound Healthy Earth.*

After the invention of “WASTE ASSIMILATOR”, it is becoming possible to produce adequate amount of ‘organic manure’ and ‘pest repellent’ through the abundantly available daily generated biodegradable solid waste to promote organic farming in every household and in every nook and corner of the globe.

Therefore introduction of “WASTE ASSIMILATOR” in every household is a logical solution to provide adequate nutrition and ‘food safety’ and to develop a healthy immune system.

Accordingly introduction of the activities in every households of the world may generate substantial amount of revenue both from the products of “WASTE ASSIMILATOR” in the form of ‘organic manure’ and ‘pest repellent’ along with the organic farming including ‘Organic Tea Gardening’ which will be sufficient to sustain the activities and people will continue the activities due to their own health and economic benefits.

From the use of “WASTE ASSIMILATOR”, beneficiary households can utilize their daily generated compostable solid waste to produce ‘Microbial-wash’ and ‘Vermi-wash’ (on a

daily basis) and finally Vermicompost for practicing organic farming. Thus through introduction of the activities in every nook and corner of the globe, discarded natural resources can be utilized to initiate an organically green, economically sound & healthy Earth with sustainable food for feeding all with adequate nutrients.

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