The Importance of Sanitation in Regards to Biosecurity in the Poultry Industry: Exporting Mobile Surface Sanitation Units to Nepal

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Abstract - Poultry Industry in Nepal

One of the most important aspects of poultry production is ensuring producers have adequate biosecurity for their facilities (Jeffrey, 1997). Biosecurity is procedures or measures designed to protect the population against harmful biological or biochemical substances (Oxford Dictionary, 2014). Whether it is small or large scale, the easiest way to maintain the cleanliness of a facility and ensure the health of the animal is through proper sanitation. This is extremely important in Nepal as the poultry industry accounts for 4% of the gross domestic product (GDP) (Misra, 2013). In fact, there are over 50 billion chickens raised each year for both meat and eggs with a meat production of 42,180 metric tonnes and an egg production of 8,74,194 (in thousand) (Mishra, 2014).

About Nepal

Topography

Nepal is a small, developing country located north of India and south of China. (See Figure 1 in the appendix for a map of Nepal) (Nepal Tourism, 2006). It is located approximately 10,564 km from Canada (Distance Calculator, 2014). It has a land area of 147,181 km and 20% of the land is arable, or suitable for growing crops (Nepal Tourism, 2006). This is important as more than 30% of the GDP in Nepal comes from agriculture (Trading Economics, 2011). Nepal is made of three topographical regions: the Himalayas, the hills and the Terai (Nepal Tourism, 2006). The Himalayas are a mountainous region located along the northern border of Nepal and includes the iconic Mt. Everest. It is home to the highest elevation of Nepal: 8848 m above sea level. The hills are located in between the Himalayas and the Terai, and are composed of rolling hills. The Terai is a flat region and is located to the south of Nepal. It is where most of Nepal's agriculture occurs as it has fertile soils and has an elevation of 70 m above sea level (Nepal Tourism, 2006).

Climate

Temperatures in Nepal range from -40℃ in the Himalayas, to 40℃ in the Terai (Nepal Tourism, 2006). Spring lasts from March to May, summer lasts from June to August, fall lasts from September to November and winter lasts from December to February. Throughout the summer months, monsoon clouds cover most of Nepal, raining almost every day and accounting for more than 1000 mm of rainfall each year (Nepal Tourism, 2006).

Population

Nepal has a population of 28.7 million people (World Population Review, 2014). The most common religion practiced throughout Nepal is Hinduism, followed by Buddhism (World Population Review, 2014). Most of the population speaks Nepali (Thompson, 2014). As they are a developing country, Nepal has to cope with overpopulation (World Population Review, 2014). The capital of Nepal, Kathmandu, houses 1,442,271 people (Mongabay, 2011). The average age for Nepalese is 21 years old, while the life expectancy is 66 years of age (World Population Review, 2014). Most of Nepal's population lays between the ages of 25 to 54 which results in a large labour force. Since Nepal is dependent on agriculture, and most of the population is involved with farming - whether it be a backyard farm or an industrial sized farm, 80% of the population lives in rural areas (World Population Review, 2014).

Government

Before Nepal officially became the Federal Democratic Republic of Nepal, there was a monarchy in place. The last King of Nepal, Gyanendra Shah, was voted out in 2008 (The Wall Street Journal, 2008). Now, like Canada, Nepal has a prime minister: Sushil Koirala

(Office of the Prime Minister and Council of Ministers, 2014). He was elected into office on February 10, 2014 (BBC News, 2014).

Economy

The currency of Nepal is the rupee. One Canadian dollar is equivalent to approximately 88 Nepalese rupee (Money Converter, 2014). Nepal is a relatively poor country with a GDP of $19.29 million US dollars, compared to Canada who has a GDP of 1.827 trillion US dollars (Trading Economics, 2014). The average monthly salary for Nepalese is roughly 32,000 rupee, while the average monthly disposable salary after taxes have been deducted is about 14,000 rupee (Numbeo, 2014).

Part 1 - Product Information

About the Mobile Surface Sanitation Unit

The mobile surface sanitation unit (model GQW-M08) uses ozone-enriched cold water rather than hot water and chemicals to disinfect surfaces on contact (Poultry Canadian Global Services, 2011). It provides disinfectant, ozone spray for tanks that hold 200 to 1000 gallons (Canadian Global Services, 2011). Ozone works on the principles of oxidation. When it comes into contact with disease causing bacteria and odour causing bacteria, it oxidizes them and leaves behind oxygen. Application requires a built-in mixing pump and oxygen concentrator (Canadian Global Services, 2011). The oxygen concentrator is made of a transformer, high voltage or high frequency electrode, insulating material and a low voltage (ground) electrode (Ozotech Inc., 2012). Oxygen is brought into the system and is split apart by a high voltage electrical field. This process creates free oxygen atoms or produces oxygen radicals (O_1) and allows them to combine with oxygen atoms (O_2) to create ozone (O_3) to be used in the disinfection of surfaces. Ozone is synthesized more efficiently if the water is cold (Ozotech Inc., 2012). (See Figures 2 and 3 and Table 1 in the appendix for specifications and diagrams of a mobile surface sanitation unit).

When disinfecting surfaces with the mobile surface sanitation unit, there is usually a two-step process that is followed: a primary rinse with hot water (cleaning step) and then a rinse with aqueous ozone (disinfecting step) (Ozone Solutions Inc, 2014). To use the mobile surface sanitation unit, the unit is plugged into an outlet and then turned on. The pump is then turned on, followed by the ozone being turned on. The wand on the unit is then directed towards the surface to be disinfected, spraying the surface with aqueous ozone. As the unit is mounted to a cart, it is mobile and can therefore be moved.

Where and How the Mobile Surface Sanitation Unit is Processed

The mobile surface sanitation unit is manufactured in Cambridge, Ontario by a Canadian company: Poultry Canadian Global Services (Poultry Canadian Global Services, 2011). (See Table 2 in the appendix for full company details). It was established by Samir Fanous in 2004 (Global Suppliers & Manufacturers Directory, 2013). They employ between 11-50 employees (Alibaba, 2014). Their markets that they supply and export to include the Middle East, Canada, the United States, South America, North Africa and the Arabian Gulf Region (Poultry Canadian Global Services, 2011). Their products and services include poultry products like cages and incubation systems, as well as poultry environment products which include hatchery ventilation system and climate control (Poultry Canadian Global Services, 2011).

The unit is made of a stainless steel container and an oxygen generator (Canadian Global Services, 2011). The container will be made by a robotic production line that is controlled by a computer as will the oxygen concentrator which contains a transformer, high voltage or high frequency electrode, insulating material and a low voltage (ground) electrode.

Labour Required and Inputs Required

During the production of a mobile surface sanitation unit, there is relatively low labour required by humans because most of the production is done by automated robots. The only input required by employees is to relay controls to the robot via a computer (Copley, 2014). This is preferred since robots are accurate, ensuring that there is a high quality to the product and they can also work in unsafe conditions if any were to arise (Copley, 2014).

Unlike the production of mobile surface sanitation units, the use of them is relatively labour intensive. The unit must be filled with water and then be moved to the desired location to be disinfected (Canadian Global Services, 2011). Depending on the size of the barn and the size of the unit bought, the tank may need to be filled several times. To disinfect surfaces, the user of the unit must hold a spray nozzle and direct the flow of aqueous ozone to the surface that needs to be disinfected.

Health Information Associated with the Mobile Surface Sanitation Unit

One of the risks associated with the mobile surface sanitation unit is ozone. Ozone is only a threat to the health of humans if inhaled at high concentrations (Canadian Global Services, 2011). The maximum acceptable concentration (MAC) value for ozone is 0.06 parts per million (PPM) for eight hours, five days a week. Symptoms of overexposure include coughing, tightness in the throat, tightness in the chest, dryness in the mouth and headache. Fortunately, an individual will be able to smell the ozone (smells like grass) before it reaches a harmful concentration (Canadian Global Services, 2011).

Since no chemicals are used to disinfect surfaces, there is no threat from chemical burns or spills (Canadian Global Services, 2011). Using aqueous ozone to disinfect surfaces will also reduce the likelihood of corroding the surface being sanitized as no

chemical residue is left behind ensuring the continuous safety of structures (Ozone Solutions Inc, 2014).

Patent Restraints

There is a utility patent not previously published involving a mobile surface sanitation unit under method and mobile apparatus for wash-down and sanitizing (Kastings *et al.*, 2002). It was issued on September 24, 2002 by the inventors: John R. Kasting, Jr., Dwayne H. Joines and John V. Winings (Kastings *et al.*, 2002). A mobile surface sanitation unit falls under this patent due to the description of the product and the claims on the product. (See Figure 4 in the appendix for a copy of the first page of the patent).

Market Opportunity

The market opportunity within Nepal is relatively large as the targeted consumers are poultry farmers/producers. There are over 1.4 million poultry farmers in Nepal providing a large market for the mobile surface sanitation units (Misra, 2013). The largest market opportunity will be in Chitwan, considered to be the poultry hub of Nepal, as that is where there is a large number of chickens (The Poultry Site, 2014). Besides being used in the poultry industry, the mobile surface sanitation units could also be used in other farming operations like the dairy industry which accounts for about 7% of the GDP in Nepal, as well as in the food industry, expanding the market opportunity further (Food and Agriculture Organization of the United Nations, 2005).

Benefits to Canada

The exportation of mobile surface sanitation units to Nepal will not only benefit Nepal, but Canada also. As demand for the mobile surface sanitation units occurs in Nepal, Canadian companies, like Poultry Canadian Global Services will need to expand their practices and hire more employees to meet demand. New jobs like an English to Nepali translator or Nepalese representative may also need to be created as they cater to a new

market. This will help to lower Canada's unemployment rate of 6.50% (Trading Economics, 2014). As more people are hired and receive jobs, their annual income will increase, benefiting their families as well as themselves.

A new increase in trade with Nepal will also result in an increase in the Canadian economy. More money will be brought into the country as there will be a new product being bought by a new market. The new trade with Nepal will not only strengthen the relationship between Canada and Nepal, but could result in further trade with surrounding countries like India or China. As they learn about the effectiveness of the product and the benefits of the product, surrounding countries will be more likely to begin trade with Canada, increasing the revenue brought in by Canadian companies and strengthening relations to prompt further trading in other sectors.

Environmental Sustainability

The production of mobile surface sanitation units is fairly environmentally sustainable. No harsh chemicals are used in the production of the product, or in the use of the product (Poultry Canadian Global Services, 2011). During production, no fossil fuels are burned, so there is no pollution of the atmosphere. No lumber is used in the production of the product, so there is no concern over damaging woodlands or rainforests.

Part 2 - Export Potential to Nepal

Transportation Logistics

The mobile surface sanitation units will be transported from Poultry Canadian Global Services located in Cambridge, Ontario to the port of Montreal located in Montreal, Quebec by FedEx. They will drive approximately 625 km and take between one to two business days (FedEx, 2014). They will be packaged in standard FedEx boxes. From there, the mobile surface sanitation units will be loaded onto a freighter (packaged in heavy duty shipping containers that include extra lining) by A1 Freight Forwarding (Alibaba, 2014). (See

Figures 5 and 6 in the appendix for specifications about shipping by freight). They will travel from the port of Montreal to a port in India: New Mangalore port. They will then be transported about 2000 km by truck from New Mangalore port to the capital of Nepal, Kathmandu (Distance Calculator, 2014). From there, they will be distributed to poultry farmers who purchased the mobile surface sanitation unit. (See Figure 7 in the appendix for a flow chart mapping the transportation route from Canadian suppliers to Nepalese buyers).

Storage

As the mobile surface sanitation unit is a piece of equipment, there is no refrigeration storage required. The only storage required by the mobile surface sanitation unit is when it is not in use. It can be stored indoors in a safe place so as not to be damaged by external forces. There are no storage requirements for ozone because it must be made on sight (Canadian Global Services, 2011). This is because unlike other gases, it quickly decays (Canadian Global Services, 2011).

Cost Analysis

The mobile surface sanitation unit from Poultry Canadian Global Services costs approximately $12,000 Canadian dollars (Bid On Equipment, 2013). This is too expensive for one Nepalese farmer, but it could be achievable for a community of poultry farmers. It is also more realistic that the mobile surface sanitation units are used by large, industrial poultry producers who have a larger income, as opposed to smaller, individual family farms.

Shipping 100 hundred mobile surface sanitation units by freighter costs about $102,420 US dollars (A1 Freight Forwarding, 2014). This means that the cost of shipping one unit is about $1024 US dollars. The shipping cost of transporting the mobile surface sanitation units by truck across the land is unknown, as well as the labour cost involved.

Therefore, the overall cost of one mobile surface sanitation unit is between $20,000 to $27,000 Canadian dollars (an estimate that includes unknown labour costs and unknown

transportation costs, as well as tariffs). The cost of a mobile surface sanitation unit may prove to be too expensive for Nepalese buyers, but may be achievable for poultry producers in richer countries. (See Table 3 in the appendix for a breakdown of the cost for a single mobile surface sanitation unit).

Needs and Benefits to Nepal

The use of a mobile surface sanitation unit will have many added benefits for the poultry industry in Nepal and for Nepal in general. Disease rates throughout the poultry industry in Nepal are quite high and they result in an alarming number of dead chickens. The most recent outbreak of “ranikhet disease” or Newcastle disease killed over 1000 chickens in one week and resulted in 500,000 rupee in damaged property (The Poultry Site, 2014). This is equivalent to $9073.37 Canadian dollars. Newcastle disease is a highly contagious disease that can affect the nervous, respiratory and gastrointestinal systems, usually resulting in a high mortality rate (Centers for Disease Control and Prevention, 2010). It is spread primarily through the feces of infected poultry coming into contact with forage, water or surfaces but can also be spread through humans when moving from flock to flock, wild animals, improperly disposed of poultry once dead and the introduction of new birds (Centers for Disease Control and Prevention, 2010).

With the mobile surface sanitation unit, poultry farmers will be able to contain and prevent disease. This will result in farmers being able to produce more chicken and eggs which will also result in a larger income for their families. They will also be able to spend less money on production as they do not have to replace large quantities of birds. This gives Nepalese farmers a chance to expand their farms. As production increases and farmers are able to produce more, Nepal also has the potential to increase trade with surrounding countries, bringing in more money for the country. The potential increase in

production also has the potential to employ more people in the industry as there will be larger flocks that need to be raised, slaughtered and transported.

Environmental Benefits to Nepal

There are no direct environmental benefits to Nepal, but there are a few indirect ones. As the mobile surface sanitation units are being used to disinfect surfaces with aqueous ozone, it will promote a healthier environment for not only poultry, but humans too. It will remove any odour causing bacteria like ammonia which is a leading cause of smog, eutrophication of water surfaces and soil acidification (Ammonia Best Management Practices, 2008). Any excess ozone is converted back to oxygen and only oxygen is left behind after sanitation, so the units could help to better the atmosphere (Canadian Global Services, 2011).

Potential Nepalese Buyers

Since the target market is poultry producers in Nepal, the potential Nepalese buyers are mainly poultry farmers, especially those with large operations. Since Chitwan is considered the poultry hub of Nepal, most of the potential Nepalese buyers will be located there, or close to Chitwan (The Poultry Site, 2014). Since the product being exported is a mobile surface sanitation unit used for disinfecting surfaces, other potential Nepalese buyers could include farmers in other livestock productions as well as people in the food industry.

Marketing Strategy

Firstly, to market the mobile surface sanitation units in Nepal, a demonstration of the product will be held at a willing poultry farm. This will expose interested and potential Nepalese buyers in the poultry industry to how the product functions. This will be beneficial as they will be able to witness firsthand how easy it is to use the mobile surface sanitation unit and the benefits associated with it.

Secondly, a pamphlet will be handed out to poultry farmers across Nepal by means of mail. It will show statistics about the number of dead chickens each year and the disease rate, as well as information about the mobile surface sanitation unit as a way to combat and protect against disease.

Lastly, once poultry farmers begin to use the mobile surface sanitation unit, a few will be selected to be interviewed biweekly for three months expanding upon how they like the product and how it has benefited them. This video will then be shown to other Nepalese poultry farmers who have not yet bought a mobile surface sanitation unit, as well as to farmers in other livestock productions in Nepal and other poultry farmers in neighbouring countries like India.

Import and Export Documentation

There are a few documents required to export the mobile surface sanitation units from Canada. An export declaration and any required permits must be submitted to the Canadian Border Services Agency (CBSA) (Canada Border Services Agency, 2008). A proof of report is also required to be presented to an export reporting officer. This is a paper copy of the Canadian Automated Export Declaration (CAED) which includes the license, authorization and form ID numbers, as well as any permits required. All goods must be reported two hours before being transported by truck, and 48 hours before being shipped by freighter (Canada Border Services Agency, 2008).

To import the mobile surface sanitation units into Nepal once it reaches the port in India, there are many pieces of documentation required. Once the shipment has reached the port in India, the following documents must be given to a clearing agent (CA): a duty insurance policy, import general manifest (IGM), letter of authority, original shipment documents, delivery order and customs transit document (CTD) with the freighter's rotation number and manifest line number (International Finance Corporation, 2014). These

documents, as well as the original invoice, original packing list, copy of letter of credit (L/C), certificate of origin (COO) and original important license must be filed under the Nepal section.

Once the mobile surface sanitation units reach the Nepalese border a Nepal customs import declaration, letter of authority, bill of lading, invoice, packing list, COO, certificate of insurance, original CTD, BBN 4 form (issued from the bank), certified copy of L/C, enterprise registration certificate, value added tax (VAT) registration certificate and income tax registration certificate must be given to the customs officer (International Finance Corporation, 2014).

Trade and Subsidy Barriers

Potential trade barriers occur mostly with Canada since Nepal (with an average tariff of 11%) is one of South Asia's most open trade countries (World Bank, 2013). Barriers in Canada include tariffs, currency fluctuation, investment regulations, environmental restrictions, foreign relations and trade sanctions and safety regulations (DPCDSB, 2014).

Loan and Grant Programs

Since it is a Canadian run business, there is a potential to receive $5,000 to $750,000 Canadian dollars in loans and grants (Canadian Grants Business Center, 2014). A proper evaluation of the business will need to be completed to determine how much money they will receive.

Regional and Global Competition

A regional competitor that sells a product similar to the ozone mobile surface sanitation unit is Guangzhou Quanju Ozone Technology Co., Ltd. located in Guangdong, China (Alibaba, 2014). They sell a chicken egg poultry farm disinfection, ozone generators for air, surface and water sanitation unit. Unlike the mobile surface sanitation unit from Canada which costs $12,000 Canadian dollars per unit, the chicken egg poultry farm

disinfection, ozone generators for air, surface and water sanitation unit costs between $2350 - $2920 Canadian dollars per unit (Alibaba, 2014). (See Table 4 in the appendix for a detailed comparison between Poultry Canadian Global Services and Guangzhou Quanju Ozone Technology Co., Ltd. and Table 5 for a comparison between the mobile surface sanitation unit and the chicken egg poultry farm disinfection, ozone generators for air, surface and water sanitation unit).

Future Studies

In order for Canadian companies like Poultry Canadian Global Services to export their product to Nepal, future studies must be conducted in a variety of areas. The cost of trucking the product from Cambridge to Quebec and from India to Nepal must be evaluated, as well as any costs associated with labour and trade. A further investigation into the loans and grants available will also need to be conducted. Poultry Canadian Global Services should also determine approximately how many units will be sold.

Conclusions and Recommendations

In conclusion, the mobile surface sanitation unit may prove to be too expensive for Nepalese consumers as they are a developing country with a limited income. To compete with Chinese producers, Canada would have to lower their prices of a mobile surface sanitation unit by possibly creating a smaller scale product. If they were able to achieve this reduction in cost, Nepalese farmers would be more willing to purchase a unit, greatly benefiting the country and themselves as the disease rate in poultry would drastically decrease.

Appendix

Figures

Figure 1 - Map of Nepal
http://www.ezilon.com/maps/images/asia/political-map-of-Nepal.gif

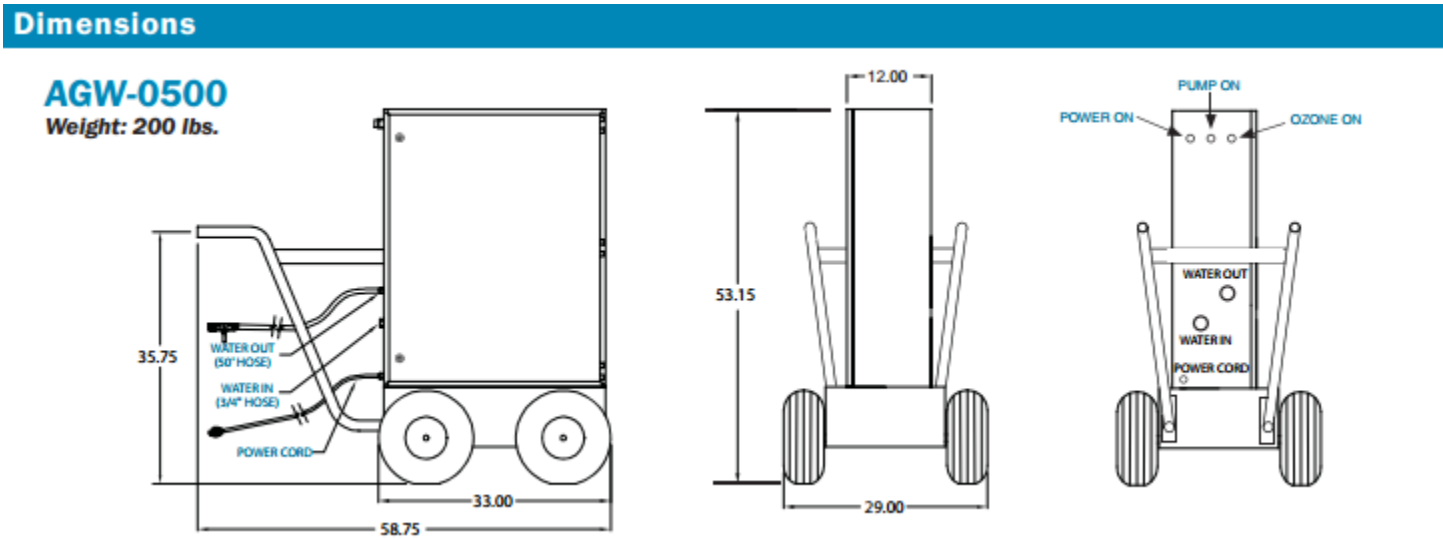


Figure 2 - Dimensions of a mobile surface sanitation unit
http://www.delozone.com/files/AGW-500_brochure.pdf

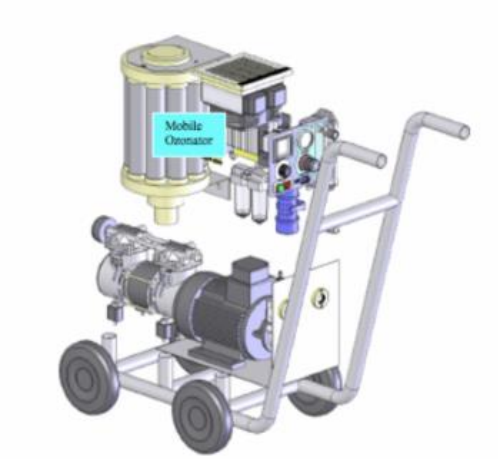
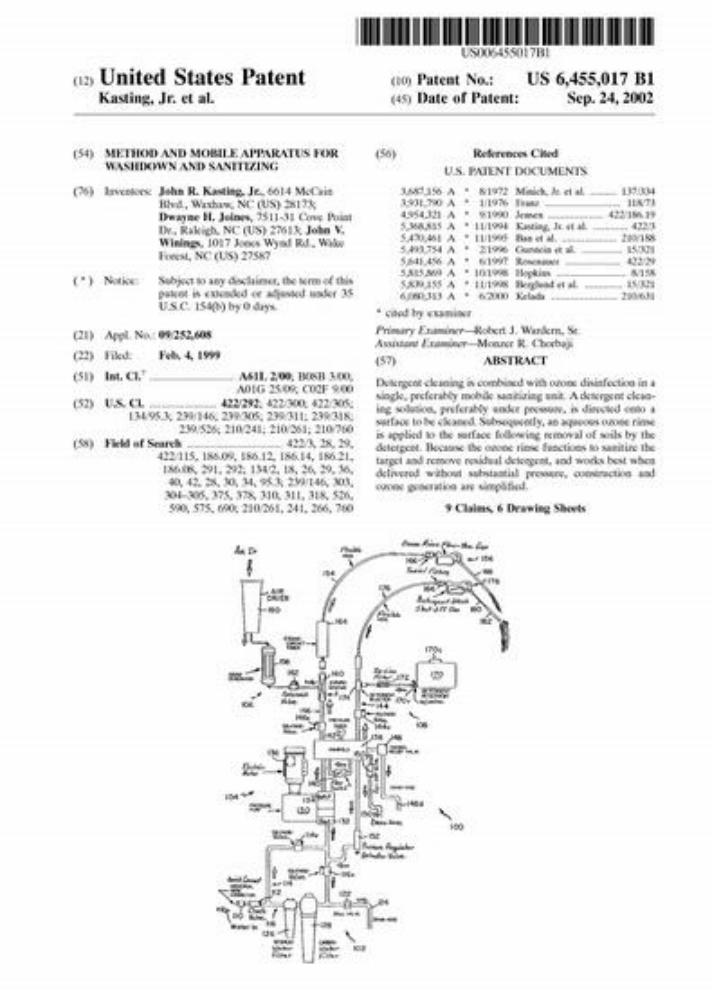


Figure 3 - Inside of a mobile surface sanitation unit
http://www.canadianglobalservices.com/mobile-ozonation.html



US006455017B1

(12) **United States Patent**
Kasting, Jr. et al.

(10) **Patent No.: US 6,455,017 B1**
(45) **Date of Patent: Sep. 24, 2002**

(54) **METHOD AND MOBILE APPARATUS FOR WASHDOWN AND SANITIZING**

(76) Inventors: **John R. Kasting, Jr.**, 6614 McCain Blvd., Waxhaw, NC (US) 28173; **Dwayne H. Joines**, 7511-31 Cove Point Dr., Raleigh, NC (US) 27613; **John V. Winings**, 1017 Jones Wynd Rd., Wake Forest, NC (US) 27587

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/252,608**

(22) Filed: **Feb. 4, 1999**

(51) **Int. Cl.**[7] **A61L 2/00**; B08B 3/00; A01G 25/09; C02F 9/00

(52) **U.S. Cl.** **422/292**; 422/300; 422/305; 134/95.3; 239/146; 239/305; 239/311; 239/318; 239/526; 210/241; 210/261; 210/760

(58) **Field of Search** 422/3, 28, 29, 422/115, 186.09, 186.12, 186.14, 186.21, 186.08, 291, 292; 134/2, 18, 26, 29, 36, 40, 42, 28, 30, 34, 95.3; 239/146, 303, 304–305, 375, 378, 310, 311, 318, 526, 590, 575, 690; 210/261, 241, 266, 760

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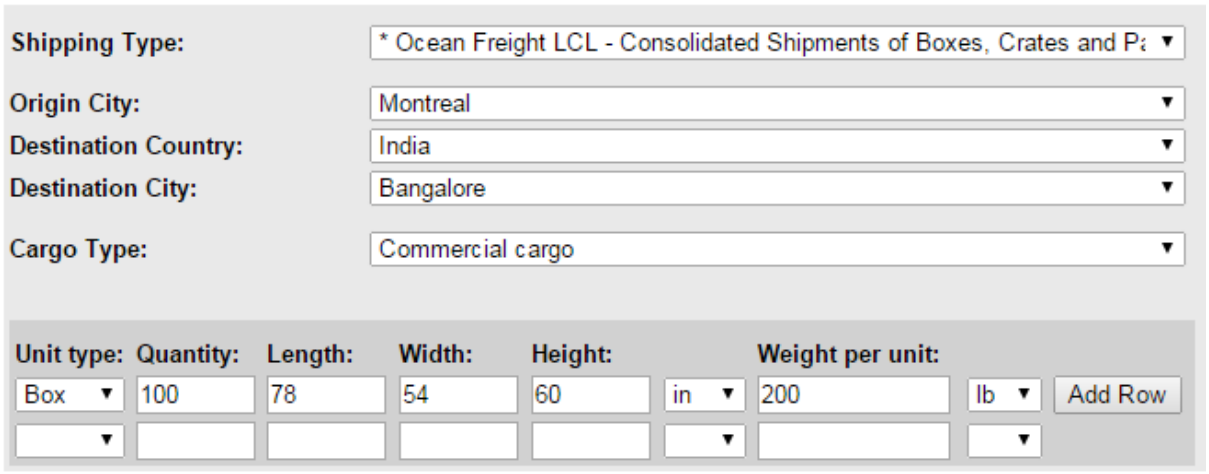
Primary Examiner—Robert J. Warden, Sr.
Assistant Examiner—Monzer R. Chorbaji

(57) **ABSTRACT**

Detergent cleaning is combined with ozone disinfection in a single, preferably mobile sanitizing unit. A detergent cleaning solution, preferably under pressure, is directed onto a surface to be cleaned. Subsequently, an aqueous ozone rinse is applied to the surface following removal of soils by the detergent. Because the ozone rinse functions to sanitize the target and remove residual detergent, and works best when delivered without substantial pressure, construction and ozone generation are simplified.

9 Claims, 6 Drawing Sheets

Figure 4 - Copy of the first page of the patent
https://drive.google.com/viewerng/viewer?url=patentimages.storage.googleapis.com/pdfs/US6455017.pdf&u=0



Shipping Type:	* Ocean Freight LCL - Consolidated Shipments of Boxes, Crates and P
Origin City:	Montreal
Destination Country:	India
Destination City:	Bangalore
Cargo Type:	Commercial cargo

Unit type:	Quantity:	Length:	Width:	Height:		Weight per unit:		
Box	100	78	54	60	in	200	lb	Add Row

Figure 5 - Specifications for freighter shipping to Nepal
http://www.a1freightforwarding.com/country/package/nepal-4/

Type	Qty	Dimensions	Weight
Box	100	54 x 78 x 60 in	200 lb

RATE:	7 $ USD PER CUBIC FOOT / MAX WEIGHT 1000 KG PER 1 CBM
Total volume	14625.08 CUBIC FEET
Minimum charges	35.32 CUBIC FEET

OCEAN FREIGHT (14625.08 CUBIC FEET)	102375.54
OVERWEIGHT CHARGES	0.00
PROCESSING FEE	45.00
PRE-CARRIAGE FROM CFS TO PORT OF LOADING	0.00
EXPORT DECLARATION	0.00
SURCHARGES	0.00
TOTAL:	102420.01 $ USD

Figure 6 - Cost analysis of shipping by freighter to Nepal
http://www.a1freightforwarding.com/quote/booking.php

Figure 7 - A flow chart mapping the transportation route from Canadian suppliers to Nepalese buyers

Tables

Specifications:

Ozone Output (±10%):	8 g/hr @ 6 SCFH with oxygen
Power requirement:	220V/50Hz-120V/60Hz available
Power consumption:	1300 Watts (With mix water pump)
Environmental Conditions:	Up to 85% Humidity, 40~100 deg F
Water Flow Rate:	35 GPM (2m3/h)
Supply Water Temp.:	40~90 deg F
Supply Water Press:	10 PSI(min)
Supply Water Flow:	35 GPM(min)
Water Connection:	1/2-inch Compression
Chassis:	Stainless Steel Chassis
Dimension (Lx W x H):	38.4-in (including handle) x 14.5-in (including tires) x 31.8-in (97.5 x 14.5x808mm)
Net Weight:	-lb (kg)

Table 1 - Specifications of the mobile surface sanitation unit
http://www.canadianglobalservices.com/mobile-ozonation.html

Company Name	Poultry Canadian Global Services
Established	2004
Owner	Samir Fanous
Location	163 Bayne Crescent, Cambridge, Ontario, N1T 1K4
Contact Information	Telephone: 1-519-623-0016
Employees	11-50

Table 2 - Full Company Details for Poultry Canadian Global Services
Poultry Canadian Global Services, 2011; Global Suppliers & Manufacturers Directory, 213; Alibaba, 2014

Unit	$12,000
Transportation	$3000 - $5000
Labour	$2000 - $3000
Trade	$1000 - $2000
Tariffs	$2000 - $5000
Total	**$20,000 - $27,000**

Table 3 - Cost breakdown for a mobile surface sanitation unit
Bid On Equipment, 2013; A1 Freight Forwarding, 2014

Company Name	Poultry Canadian Global Services	Guangzhou Quanju Ozone Technology Co., Ltd.
Location	163 Bayne Crescent, Cambridge, Ontario, N1T 1K4	Guangdong, China (Mainland)
Established	2004	2010
Employees	11-50	51-100
Products/Services	Poultry products, poultry environment products and chick hatcheries, specifically chicken cages, incubation systems, sanitation products, hatchery ventilation systems and climate control systems	Ozone generator water treatment, ceramic plate ozone generator, automobile air purifier, household/industrial ozone generator, air feeding ozone generator and ozonated washing machine
Markets	Middle East, Canada, the United States, South America, North Africa and the Arabian Gulf Region	Western Europe, Eastern Asia, Mid East, Domestic Market, South Asia

Table 4 - Detailed comparison between Poultry Canadian Global Services and Guangzhou Quanju Ozone Technology Co., Ltd.
Poultry Canadian Global Services, 2011; Alibaba, 2014

Product	Mobile Surface Sanitation Unit by Poultry Canadian Global Services	Chicken egg poultry farm disinfection, ozone generators for air, surface and water sanitation unit by Quanju Ozone Technology Co., Ltd.
Ozone Output	8 g/hr	50 g/hr
Power Requirement	220V/50Hz - 120V/60Hz	220/110V 50/60Hz
Power Consumption	1300 watts	1200 watts
Chassis	Stainless steel	Stainless steel 304
Dimension	97.5x14.5x808mm	550x400x1330 mm
Net Weight	90.7kg	75.5kg

Table 5 - Detailed comparison between a mobile surface sanitation unit and a chicken egg poultry farm disinfection, ozone generators for air, surface and water sanitation unit
Alibaba, 2014; Canadian Global Services, 2011

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