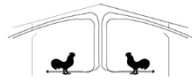




The University of Georgia

**Cooperative Extension Service**

College of Agricultural and Environmental Sciences/Athens, Georgia 30602-4356



## *Poultry Housing Tips*

Volume 5 Number 3

Exhaust Fans with Shutter Opening Devices

March, 1993

One of the most common complaints about power ventilation is cleaning fan shutters. It is a constant battle. You clean the shutters one day and a few days later they are covered with dust and hanging partly closed again. Studies conducted by The University of Georgia Cooperative Extension Service found that in commercial egg laying houses over a quarter of a pound of dust collect on shutters each day. This means that shutters require practically daily cleaning. In broiler houses shutters don't collect dust quite as quickly. Nevertheless, broiler house fan shutters should be cleaned at least weekly and considering the number of fans on most broiler farms, this can be quite a time consuming chore.

In addition to the time commitment, cleaning fan shutters is a tough task. Cleaning fan shutters is one of the dirtiest jobs on a poultry farm. When there are birds in a house and the fans are running, it's nearly impossible to clean a fan shutter without getting covered with dust. The cleaning process can damage the shutters if special care is not taken, resulting in shutters that won't close completely when the fans shut off. As a result of all this, fan shutters rarely get cleaned as often as they should.

Electricity bills are higher and bird performance is lower because shutters do not get cleaned on a regular basis. A number of studies have shown that dirty shutters reduce the amount of air moved by a fan by 30 percent or more. If each fan moves less air, more fans are necessary to do the job, resulting in higher electricity usage. During the summer months, if all the exhaust fans are moving 30 percent less air than they should, this is the same as turning off 30 percent of the fans. This of course would result in higher house temperatures and increased heat stress problems.

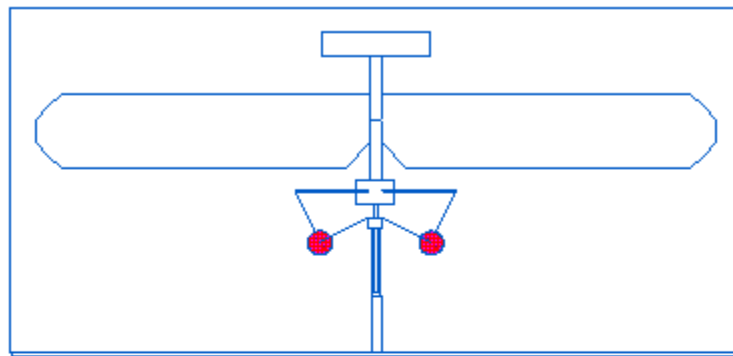
What is the solution to this problem? One possible solution for growers who are building new housing or upgrading their ventilation system(s) is to consider a new type of fan which mechanically opens its own shutters in a unique way. Most shutters are opened by the air exiting the fan blowing the shutter open. Any dust that is in the air quickly accumulates on the shutters, increasing the overall weight of the shutters. The heavier the shutters, the harder it is for the fan to blow air through them, and the less air the fan moves.

This new fan incorporates a set of rotating weights connected to the fan motor shaft. As the motor speeds up, the rotating weights move away from the shaft due to centrifugal force.

Through a series of linkages, the movement of the weights forces the shutters wide open. As the fan shuts off, the weights move back toward the shaft and the shutters, assisted by small springs, close.

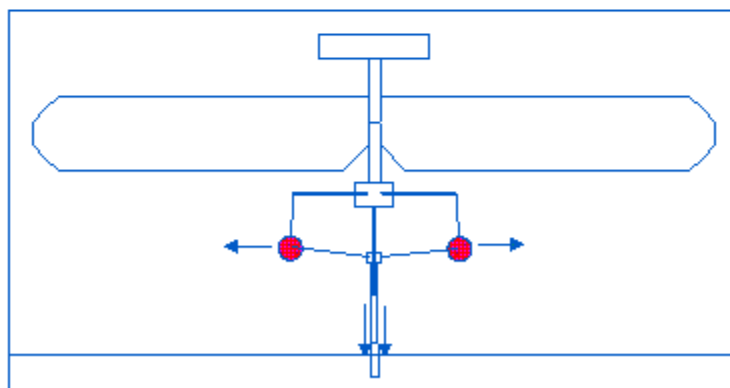
Since the shutters open fully, dust does not collect on the shutters as quickly as on conventional shutters. Even when dust does accumulate, it does not affect the opening of the shutter because the weight of the dust is insignificant when compared to the centrifugal force generated by the rotating weights. Since the dust does not affect fan performance, a grower can wait until the end of the growout before having to clean his fans.

*Fan Off*



*Shutters Closed*

*Fan On*



*Shutters Open*

Lab tests conducted by The University of Illinois found the air moving capacity and energy usage of the new fan are comparable to other fans of the same size. But lab tests don't tell the whole story. Measurements taken over the past year by The University of Georgia Extension Engineering Department on a contract broiler farm with tunnel-ventilated houses have found the fan to move 15% or more air than conventional fans with either interior or exterior shutters. The

amount of difference in air moving ability was dependent upon the amount of dust on the shutters of the conventional fans. The greater the amount of dust on the shutters, the lower the amount of air fans with conventional shutters moved. Dust accumulation on shutters did not appear to affect the amount of air moved by the new fan. Over the course of the study, no mechanical problems were encountered with any of the seven 48" fans installed on the farm.

With any "new" product there is always the question of reliability. Since the fan does have more moving parts it may require some additional mechanical maintenance, i.e., occasionally replacing linkages and springs. And as with any foreign made product, spare parts availability should be considered. But, a positive aspect of the fan's reliability is that it has been successfully sold worldwide for over 10 years.

New developments in poultry equipment are continuously being made around the world. The exchanging of ideas and equipment has contributed to the tremendous growth of the poultry industry worldwide. A company in one part of the world develops an idea, and another in a different area of the world improves upon it. In the long run everyone benefits.

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Michael Czarick  
Extension Engineer  
(706) 542-9041  
(706) 542-1886 (FAX)  
[mczarick@bae.uga.edu](mailto:mczarick@bae.uga.edu)

Mike Lacy  
Extension Poultry Scientist  
(706) 542-9153  
(706) 542-8383 (FAX)  
[mlacy@uga.cc.uga.edu](mailto:mlacy@uga.cc.uga.edu)

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